Vol. 896 Number 4

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# OFFICIAL GAZETTE

## of the UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

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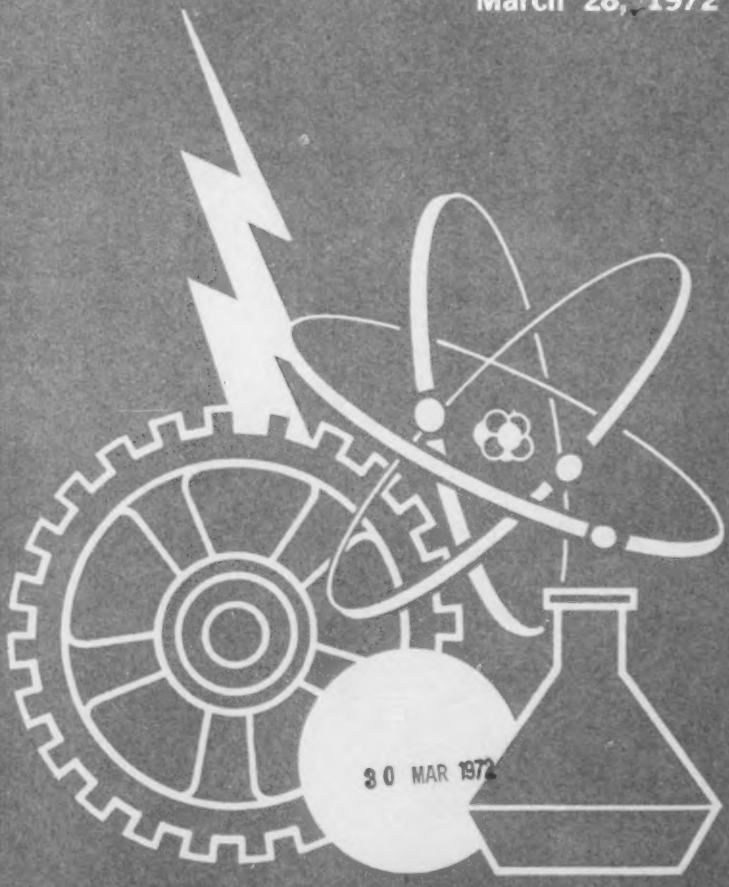
PATENTS

March 28, 1972



30 MAR 1972

U.S. DEPARTMENT OF COMMERCE
Patent Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

March 28, 1972 Volume 896 Number 4

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# PATENT OFFICE NOTICES

## Notice—Annual Index of Patents

The 1970 edition of the Annual Index of Patents has been published. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

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Part I—$14.00
Part II—$4.50

## Certificates of Correction for the Week of Mar. 28, 1972

| | | | |
|---|---|---|---|
| Re. 27,159 | 3,592,713 | 3,602,698 | 3,608,978 |
| Re. 27,197 | 3,592,889 | 3,602,711 | 3,609,170 |
| D. 221,683 | 3,593,314 | 3,602,721 | 3,609,175 |
| 3,317,577 | 3,593,575 | 3,602,952 | 3,609,261 |
| 3,416,425 | 3,594,481 | 3,603,414 | 3,609,286 |
| 3,442,488 | 3,594,614 | 3,603,741 | 3,609,349 |
| 3,482,971 | 3,594,882 | 3,603,765 | 3,609,375 |
| 3,484,443 | 3,595,229 | 3,603,799 | 3,609,403 |
| 3,488,423 | 3,595,856 | 3,603,873 | 3,609,499 |
| 3,496,344 | 3,595,864 | 3,603,962 | 3,609,503 |
| 3,503,464 | 3,595,961 | 3,604,004 | 3,609,618 |
| 3,506,716 | 3,596,275 | 3,604,064 | 3,609,641 |
| 3,508,874 | 3,596,468 | 3,604,075 | 3,609,823 |
| 3,531,507 | 3,596,515 | 3,604,229 | 3,610,308 |
| 3,535,325 | 3,596,525 | 3,604,279 | 3,610,316 |
| 3,546,163 | 3,596,724 | 3,604,455 | 3,610,338 |
| 3,547,583 | 3,597,051 | 3,604,811 | 3,610,371 |
| 3,548,608 | 3,597,283 | 3,604,841 | 3,610,383 |
| 3,549,764 | 3,597,373 | 3,604,904 | 3,610,435 |
| 3,553,516 | 3,597,383 | 3,604,977 | 3,610,473 |
| 3,553,647 | 3,597,504 | 3,605,024 | 3,610,618 |
| 3,554,111 | 3,597,508 | 3,605,030 | 3,610,720 |
| 3,554,253 | 3,597,593 | 3,605,059 | 3,610,738 |
| 3,554,440 | 3,597,691 | 3,605,473 | 3,610,946 |
| 3,555,839 | 3,597,820 | 3,605,569 | 3,611,002 |
| 3,555,840 | 3,597,893 | 3,606,128 | 3,611,042 |
| 3,559,356 | 3,598,215 | 3,606,677 | 3,611,278 |
| 3,562,268 | 3,598,249 | 3,607,174 | 3,611,505 |
| 3,565,547 | 3,598,521 | 3,607,222 | 3,611,929 |
| 3,565,766 | 3,598,611 | 3,607,256 | 3,612,260 |
| 3,570,603 | 3,598,740 | 3,607,352 | 3,612,283 |
| 3,573,901 | 3,598,770 | 3,607,371 | 3,612,791 |
| 3,575,107 | 3,598,793 | 3,607,407 | 3,612,908 |
| 3,575,976 | 3,598,828 | 3,607,438 | 3,613,182 |
| 3,576,564 | 3,598,982 | 3,607,520 | 3,614,318 |
| 3,577,558 | 3,599,055 | 3,607,537 | 3,614,577 |
| 3,580,449 | 3,599,205 | 3,607,576 | 3,614,719 |
| 3,580,750 | 3,599,791 | 3,607,694 | 3,614,857 |
| 3,581,361 | 3,600,307 | 3,607,731 | 3,615,254 |
| 3,581,570 | 3,600,351 | 3,607,814 | 3,615,448 |
| 3,583,221 | 3,600,468 | 3,607,882 | 3,615,561 |
| 3,584,047 | 3,600,472 | 3,607,980 | 3,615,712 |
| 3,584,188 | 3,601,550 | 3,607,983 | 3,615,792 |
| 3,585,714 | 3,602,026 | 3,608,002 | 3,615,861 |
| 3,587,079 | 3,602,315 | 3,608,060 | 3,615,905 |
| 3,588,290 | 3,602,400 | 3,608,084 | 3,615,906 |
| 3,589,697 | 3,602,523 | 3,608,137 | 3,616,351 |
| 3,591,503 | 3,602,528 | 3,608,565 | 3,616,572 |
| 3,591,607 | 3,602,531 | 3,608,849 | |
| 3,591,709 | 3,602,551 | 3,608,889 | |

## Dedications

3,252,882.—*Lynn A. Williams*, Winnetka, Ill. APPARATUS FOR REMOVING SLUDGE FORMED DURING ELECTROLYTIC SHAPING AND CAVITY SINKING FROM CONTAMINATED ELECTROLYTE. Patent dated May 24, 1966. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company*.

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,254,013.—*Lynn A. Williams*, Winnetka, Ill. ELECTROLYTIC CAVITY SINKING APPARATUS. Patent dated May 31, 1966. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company*.

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,256,165.—*Lynn A. Williams*, Winnetka, Ill. METHOD AND APPARATUS FOR USE IN ELECTRILYTIC SHAPING. Patent dated June 14, 1966. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company*.

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,257,300.—*Lynn A. Williams*, Winnetka, Ill. METHOD FOR ELECTROLYTICALLY FORMING TAPERED OR CONTOURED CAVITIES. Patent dated June 21, 1966. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company*.

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,275,543.—*Lynn A. Williams*, Winnetka, Ill. ELECTROLYTIC CAVITY SINKING APPARATUS. Patent dated Sept. 27, 1966. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company*.

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,276,987.—*Lynn A. Williams*, Winnetka, Ill. ELECTROLYTIC SHAPING APPARATUS. Patent dated Oct. 4, 1966. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company*.

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,276,988.—*Lynn A. Williams*, Winnetka, Ill. ELECTROLYTIC REMOVAL OF WORK MATERIAL. Patent dated Oct. 4, 1966. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company*.

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,287,245.—*Lynn A. Williams*, Winnetka, Ill. METHOD AND APPARATUS FOR USE IN ELECTROLYTIC MACHINING. Patent dated Nov. 22, 1966. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company*.

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

# PATENT EXAMINING CORPS

**R. A. WAHL, Assistant Commissioner**
**F. H. BRONAUGH, Deputy Assistant Commissioner**

## CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 22, 1972

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 1-08-71 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 9-04-70 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes. | 12-02-70 |
| COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography. | 2-01-71 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 9-14-70 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous. | 6-23-71 |
| SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material. | 9-11-70 |
| INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 2-05-71 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 3-04-71 |
| PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments. | 1-04-71 |
| DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts. | 1-04-71 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages. | 1-06-71 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks. | 1-04-71 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination. | 12-02-70 |
| HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing. | 2-22-71 |
| CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling. | 1-15-71 |

**Expiration of patents:** The patents within the range of numbers indicated below expire during March 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,702,901 to 2,705,321, inclusive
Plant Patents..... Numbers 1,255 to 1,373, inclusive

# DEFENSIVE PUBLICATIONS

## PUBLISHED MARCH 28, 1972

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

### T896,048
### METHOD FOR MAKING SEMICONDUCTOR JUNCTION DEVICES

**John M. Fairfield, Wappingers Falls, and Madhukar Joshi and Guenter H. Schwuttke, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of application Ser. No. 704,058, Feb. 8, 1968. This application Aug. 20, 1970, Ser. No. 65,666**

**Int. Cl. B01j** *17/00*

**U.S. Cl. 148—188**

**1 Sheet Drawing. 16 Pages Specification**

In the method for diffusing an impurity into a semiconductor substrate, a coating which includes the impurity to be diffused is applied to the surface of the substrate and a pulsed laser beam is directed to one or more localized areas of the coated surface of the substrate. The duration and relative location of the beam and substrate is controlled to achieve the desired diffused region configuration.

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### T896,049
### MODIFIED BOBBIN CHUCK

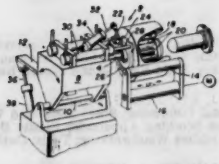
**William D. Decker, 1312 Runnymeade SW; and Andrew P. Carter, Jr., 2008 Nelson St. SE., both of Decatur, Ill. 35601; and Charles R. Lewis, 506 Greendale Drive, Huntsville, Ala. 35806**

**Filed Sept. 25, 1970, Ser. No. 75,510**

**Int. Cl. B65h** *54/00, 67/04*

**U.S. Cl. 242—18 R**

**1 Sheet Drawing. 7 Pages Specification**



A device for winding packages of textile yarn on a bobbin is provided with electropneumatic means for convenient removal of the bobbin from the winding device. The device includes a driven bobbin chuck having a free-end spindle journalled in a pivotally mounted casing and clutch bars expandable outwardly to hold the bobbin during winding and rotatable to release the bobbin during removal. An annular plate is concentrically mounted about the spindle and is accuated forwardly towards the free end of the spindle to push the bobbin off the chuck during doffing. During winding, the plate is in a retracted position. Electropneumatic means is connected to the plate, the chuck, and the casing, and is operable to remove the bobbin.

### T896,050
### COMMINUTED MEAT COMPOSITION CONTAINING UNDENATURED WATER-SOLUBLE LACTALBUMIN

**Floyd C. Olson, 505 N. Midvale Blvd., Madison, Wis. 53705, and Donald W. Hoar, 2033 Colorado Ave., Sun Prairie, Wis. 53590**

**Filed Sept. 25, 1970, Ser. No. 75,707**

**Int. Cl. A22c**

**U.S. Cl. 99—108**

**No Drawing. 13 Pages Specification**

Comminuted meat compositions such as sausage containing undenatured water-soluble lactalbumin. Lactalbumin concentrate is used in the comminuted meat composition in an amount in the range from 1% to 20%. Protein concentration in the lactalbumin concentrate may vary from 15 to 90%. The lactalbumin concentrate which is used in accordance with this invention is prepared from whey by methods which do not incur heat denaturation, and which do not require addition of chemicals, e.g., long chain polyphosphates, to the whey. Suitable lactalbumin concentrates may be prepared by concentration of whey by evaporation at low temperatures so as to crystallize and separate lactose, by electrodialysis, which provides lower ash content, by reverse osmosis with selected membranes which allows lactose and salt to go through while holding back lactalbumin protein, or by initial refinement of the dispersed protein by passing whey or slightly concentrated whey through a Sephadex column of selected resins which holds lactose and salt and allows lactalbumin to go through. In accordance with this invention, concentrated aqueous lactalbumin, or solid lactalbumin concentrates can be employed. The invention is particularly applicable to the manufacture of wieners, for example.

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### T896,051
### PROCESS FOR FORMING COLLODIAL POLYMERIC DISPERSIONS FOR MAKING MICROPOROUS MATERIALS

**Arthur H. Hamlin, Kennett Square, Pa., Henn Kilkson, Wilmington, Del., and Harry P. Wood, Wilton, Conn., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of application Ser. No. 667,411, Sept. 13, 1967. This application Nov. 12, 1970, Ser. No. 89,136**

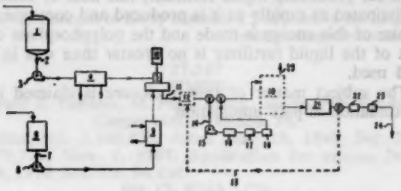
**Int. Cl. C08g** *22/04, 53/18*

**U.S. Cl. 260—29.2 TN**

**1 Sheet Drawing. 21 Pages Specification**

A process for forming a colloidal polymeric dispersion used in making microporous sheet material having a secant tensile modulus at 5% elongation of about 600 p.s.i. by microblending a solution of a polymeric component and a solution of a solvent and a non-solvent for the polymeric component. The microblending being achieved in about 0.5–5 seconds in a high shear mixing zone having a shear rate of 1,000–150,000 reciprocal seconds and of a stream of a solution of a polymeric component, and particularly a linear polyurethane or a blend of a linear

polyurethane and poly (vinyl chloride), at about 15–60° C. and of a stream of an organic solvent and non-solvent, particularly water, at about 20–50° C. The quantity of organic solvent being about 95–25% and the quantity of non-solvent being about 5–75%. The temperature of the blend being thereafter reduced about 2–50° C. to form a colloidal polymeric dispersion having a non-solvent content of about 3–5% by weight.



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**T896,052**
**WIRE AND CABLE WRAPPING MATERIAL**
**Gerald H. Zimmerman, Claymont, Del., assignor to Hercules Incorporated, Wilmington, Del.**
**Filed Dec. 4, 1970, Ser. No. 95,228**
**Int. Cl. B32b *3/00***
**U.S. Cl. 161—123**
**1 Sheet Drawing. 5 Pages Specification**

An improved dielectric protective barrier for electrical conductive wire and cable is provided by a striated film of a plastic material having high dielectric strength. Preferred plastic materials are polyethylene terephthalate and polypropylene. The striated film acts as an improved thermal insulator because of the natural insulating effect of the polymer and also due to the entrapment of air between the raised ribs of the film. During periods of over potential on the wire conductors the barrier sheet helps to prevent a dielectric failure of the insulation on the conductors.

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**T896,053**
**RETOUCHING COLORED PHOTOGRAPHIC IMAGES**
**Charleton C. Bard and Joseph O. Kleffner, both of 1669 Lake Ave., Rochester, N.Y. 14650**
**Filed Feb. 12, 1971, Ser. No. 115,090**
**Int. Cl. G03c *7/00***
**U.S. Cl. 96—56**
**No Drawing. 5 Pages Specification**

Colored photographic images obtained in multilayer color films by means of color development are retouched to reduce the cyan dye density by treatment of the images composed of the cyan dye with an iodine-potassium iodide solution having a pH of about 5.5 to 6.5. The images are then treated with ammonium thiosulfate and washed.

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**T896,054**
**PLASTICIZERS FOR HYDROXYPROPYL CELLULOSE**
**William P. Long, Jr., Wilmington, Del., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.**
**Filed Mar. 12, 1971, Ser. No. 123,876**
**Int. Cl. C08h *17/34***
**U.S. Cl. 106—188**
**No Drawing. 6 Pages Specification**

Extrudable compositions of hydroxypropyl cellulose resins are obtained by the addition of up to 20% by weight of a plasticizer selected from the group of polyolethers consisting of polyoxypropylene(10)sorbitol, polyoxypropylene(1)sorbitol, polyoxyethylene(4)phenol, and decaglycerol. Such polyol-ether plasticizers are produced by reacting propylene oxide with sorbitol; ethylene oxide with phenol; and the dehydration of glycerine, respectively. The plasticizers are especially useful in hydroxypropyl cellulose compositions having an average of 2–5 hydroxypropyl groups per anhydroglucose unit. The compositions of the invention have excellent thermoplasticity and are particularly useful in manufacturing cold water-soluble films, coatings, and shapes.

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**T896,055**
**COORDINATED IONIC HYDROCARBON COPOLYMERS**
**Victor Clarence Long, Parkersburgh, W. Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**
**Continuation-in-part of application Ser. No. 569,045, Aug. 1, 1966, and a continuation of application Ser. No. 863,384, Oct. 2, 1969. This application Mar. 16, 1971, Ser. No. 124,925**
**Int. Cl. C08f *15/40***
**U.S. Cl. 260—88.1 R**
**No Drawing. 21 Pages Specification**

Coordinated ionic hydrocarbon copolymers of ethylene and alpha,beta-ethylenically unsaturated carboxylic acids of 3 to 8 carbon atoms containing at least 50 mole percent ethylene based on the copolymer, the alpha,beta-ethylenically unsaturated carboxylic acid content of the copolymer being from .2 to 25 mole percent based on the copolymer, the carboxylic acid groups of the copolymers being at least partially ionized by metal ions such as $Cu^{+2}$, $Co^{+2}$, $Ni^{+2}$, $Mg^{+2}$, and $Zn^{+2}$, the metal ions being present in an amount equivalent to from about 10 to 180 percent of the carboxylic acid groups, at least some of the metal ions of the copolymer being coordinated with at least one of the following: alkylene amines, n-heptyl amine, t-octyl amine, octadecyl amine, piperidine, piperazine and its derivatives, 8-hydroxyquinoline, o-phenylene diamine, hexamethylenediamine, morpholine and its derivatives, salicylaldehyde, salicylic acid, acetylacetone, o-dihydroxybenzene, 2-aminobenzene thiol, picolinic acid, anthranilic acid, electron donor dyes, poly(ethylene imine), and substituted poly(ethylene imine).

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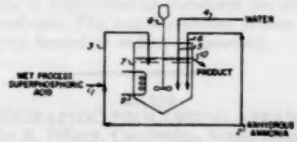
**T896,056**
**AMMONIUM POLYPHOSPHATE SOLUTIONS FROM SUPERWET ACID**
**Robert S. Meline, 310 McKinley Ave., Florence, Ala. 35630**
**Filed Mar. 22, 1971, Ser. No. 126,680**
**Int. Cl. C05b *7/00***
**U.S. Cl. 71—34**
**2 Sheets Drawing. 24 Pages Specification**




Superwet-process phosphoric acid having from about 5 to about 50 percent of its phosphorus values in the polyphosphate form (i.e., equivalent to about 68.5 to about 72 percent $P_2O_5$ concentration) is reacted with ammonia under conditions that simultaneously neutralize and further molecularly dehydrate the acid whereby the resulting ammonium polyphosphate product is a true solution

having improved self-sequestering properties and whereby at least about 80 percent of the phosphorus values therein is in the polyphosphate form (nonorthophosphate). The reaction takes place in a common pipe line through which the phosphoric acid and all or part of the ammonia required for a given grade of liquid fertilizer are fed to the liquid fertilizer vessel. The anhydrous melt formed by the reaction is quenched in the liquid fertilizer which is maintained at a temperature in the range of 130–180° F. by a cooling system. In this vessel the additional ammonia, if required, and the water required are added. Any of the conventional cooling systems may be used. The heat of reaction between the phosphoric acid and ammonia provides the energy for the molecular dehydration of the acid. In established processes for producing liquid fertilizer, this heat of reaction is dissipated as rapidly as it is produced and consequently no use of this energy is made and the polyphosphate content of the liquid fertilizer is no greater than was in the acid used.

The subject matter of this disclosure is claimed in a continuation-in-part application.

# REISSUES

## MARCH 28, 1972

**Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.**

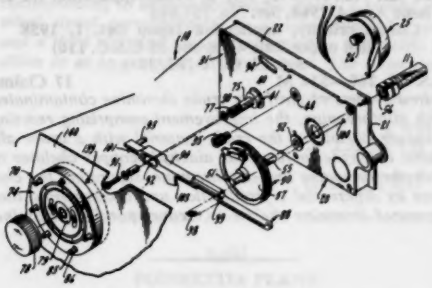
### 27,317
### TIMER

**Edward J. Tischler, St. Paul, Minn., assignor to Ecodyne Corporation, Chicago, Ill.**

**Original No. 3,448,625, dated June 10, 1969, Ser. No. 679,722, Nov. 1, 1967. Application for reissue Nov. 16, 1970, Ser. No. 90,030**

**Int. Cl. F16h** *5/74*

**U.S. Cl. 74—3.5** **9 Claims**



A timing device for operating a mechanism at a predetermined time on a given day or days. The device includes a timer dial and a pinion driven by separate gear trains from the same motor and constantly in operation. A mechanism drive gear is connected to the pinion and rotated by it at said time through an actuator arm manipulated by the timer dial.

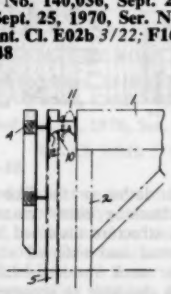
### 27,318
### DOCK FENDER

**Joseph R. Gensheimer, Erie, Pa., assignor to Lord Corporation, Erie, Pa.**

**Original No. 3,172,268, dated Mar. 9, 1965, Ser. No. 356,364, Mar. 30, 1964, which is a continuation-in-part of Ser. No. 140,036, Sept. 22, 1961. Application for reissue Sept. 25, 1970, Ser. No. 75,796**

**Int. Cl. E02b** *3/22;* **F16f** *7/12*

**U.S. Cl. 61—48** **6 Claims**



*A fender extends along and is spaced in front of and presented to an edge of a dock and has means supporting the same for movement toward and away from and along the dock. A plurality of mountings are spaced along and extend between the fender and the edge of the dock and each comprises a generally horizontally extending body of elastomer in the form of a column having length, width and thickness. Each body is arranged with its width extending along the edge of the dock and its length extending out from the edge of the dock. A plate is fastened to each end of the body with one plate being attached to the fender and the other to the edge of the dock. The greater ratio of the length to the minimum width and of the length to the minimum thickness is at least substantially two whereby the body will sustain load from the fender in compression until the load reaches a threshold and will thereafter buckle with further deflection without a substantial increase in load.*

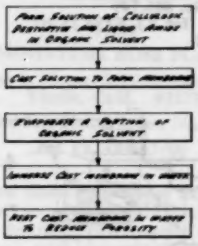
### 27,319
### METHOD OF PREPARING A SEMIPERMEABLE MEMBRANE

**Serop Manjikian, Del Mar, Calif., Sidney Loeb, Laurel, Md., and Joseph W. McCutchan, Los Angeles, Calif., assignors to The Regents of The University of California, Berkeley, Calif.**

**Original No. 3,344,214, dated Sept. 26, 1967, Ser. No. 354,775, Mar. 25, 1964. Application for reissue Sept. 16, 1969, Ser. No. 866,414**

**Int. Cl. B01d** *27/04;* **C08b** *29/10, 29/16*

**U.S. Cl. 264—41** **13 Claims**


FORM SOLUTION OF CELLULOSIC DERIVATIVE AND LIQUID AMIDE IN ORGANIC SOLVENT
CAST SOLUTION TO FORM MEMBRANE
EVAPORATE A PORTION OF ORGANIC SOLVENT
IMMERSE CAST MEMBRANE IN WATER
HEAT CAST MEMBRANE IN WATER TO REDUCE POROSITY

*A method of preparing a semipermeable membrane adapted to permit substantially selective diffusion therethrough of a component of a solution. The membrane is prepared from a solution containing a cellulosic ester or ether derivative and a water-soluble liquid amide having the formula $R_6CONR_7R_8$ wherein $R_6$ is from the class consisting of hydrogen, methyl and ethyl groups and $R_7$ and $R_8$ are from the class consisting of hydrogen, ethyl and propyl groups without both $R_7$ and $R_8$ being hydrogen. The solution is cast on a support. A portion of the liquid amide is evaporated to transform the cast solution into a membrane. The cast membrane is then immersed in water and heated to reduce its porosity.*

### 27,320
### PHOTOGRAPHIC PROCESSING APPARATUS

**Douglas B. Tiffany, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

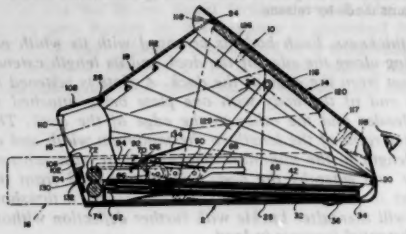
**Original No. 3,447,437, dated June 3, 1969, Ser. No. 655,808, July 25, 1967. Application for reissue Aug. 7, 1969, Ser. No. 860,445**

**Int. Cl. G03b** *17/52*

**U.S. Cl. 95—13** **16 Claims**

A self-developing camera including a pair of processing rollers for advancing a film unit between the rollers to

process the film unit and a feed roller driven simultaneously with the processing rollers for frictionally engaging and feeding the film units, one at a time, from a film pack container into the bite of the processing rollers. The mount-



ing for the feed roller is coupled with one of the processing rollers so as to disenable the feed roller to feed a film unit into the bite of the processing rollers as long as a film unit is engaged therebetween.

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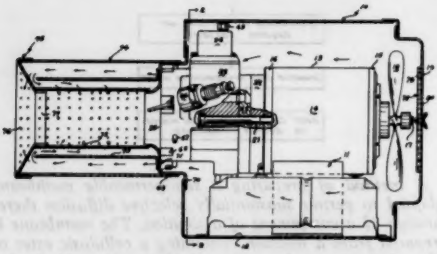
**27,321**
**OIL BURNER**

**Eugene C. Briggs, Dayton, Ohio, assignor to Koehring Company, Milwaukee, Wis.**

**Original No. 3,298,418, dated Jan. 17, 1967, Ser. No. 358,356, Apr. 8, 1964. Application for reissue Jan. 14, 1969, Ser. No. 806,749**

**Int. Cl. F23d** *15/02*

**U.S. Cl. 431—352** **17 Claims**



1. An oil burner unit consisting of a burner head and, connected integral therewith, a compressor and a drive motor in end to end relation, means defining a nozzle recess in said head and, in connection therewith, a fuel passage, a low pressure aspirating nozzle having a portion anchored in said head to form a flow passage thereabout in said nozzle recess and have one end thereof communicate with said fuel passage, means defining a further passage in said head communicating said compressor with said flow passage whereby on drive of said motor, air will flow under pressure to swirl in said recess about said nozzle, said nozzle having aspirating passages which open at one end to receive the swirling air and deliver it at a high velocity to the interior of said nozzle whereby to suck fuel from said fuel passage to exit therewith from said nozzle and flow regulator means interposed to normally block the flow of fuel through said fuel passage, said regulator means having two chambers and a diaphragm forming a wall therebetween, one of said chambers having an inlet and an outlet interposed in respect to said fuel passage, the other said chambers having a vent and means included in said one chamber operative to block the flow of fuel through said fuel passage except on the occurrence of a high velocity flow of air to and through said nozzle.

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**27,322**
**ISOLATION OF THREONINE AND ALLOTHREONINE FROM THEIR MIXTURE**

**Kiichi Fujii, Kyoto-shi, Mutsuo Oda, Tokyo-to, Junichiro Arita, Moriguchi-shi, Mikio Takeda, Saitama-ken, and Kango Sakai, Toyonaka, Japan, assignors to Tanable Seiyaku Co., Ltd., Osaka, Japan**

**No Drawing. Original No. 3,068,281, dated Dec. 11, 1962, Ser. No. 814,374, May 20, 1959, which is a continuation of Ser. No. 293,573, July 2, 1962. Application for reissue Apr. 4, 1968, Ser. No. 757,805**

**Claims priority, application Japan Oct. 1, 1958**

**(Filed under Rule 47(a) and 35 U.S.C. 116)**

**Int. Cl. C07c** *101/30*

**U.S. Cl. 260—534 M** **17 Claims**

*In a process of purifying crude threonine contaminated with allothreonine, the improvement comprising reacting a copper chelate of the crude material with a lower aliphatic aldehyde to form the aldehyde-copper chelates of both the threonine and allothreonine, separating the chelates by differential crystallization and decomposing they separated threonine chelate to recover purified threonine.*

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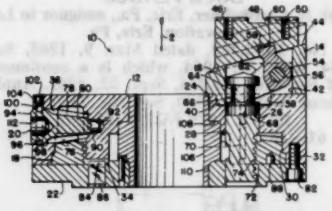
**27,323**
**CHUCK**

**William G. Platt, Detroit, and Roy T. Jacks, Warren, Mich., assignors to George E. Blake, Grosse Pointe, and Raymond J. Youngblood, Jr., Grosse Pointe Woods, Mich., fractional part interest to each**

**Original No. 3,468,550, dated Sept. 23, 1969, Ser. No. 552,040, May 23, 1966. Application for reissue Aug. 24, 1970, Ser. No. 66,662**

**Int. Cl. B23b** *31/14*

**U.S. Cl. 279—2** **16 Claims**



Chuck structure for lathes or the like capable of internal or external chucking either manually or automatically. The chuck structure disclosed has a pulldown feature in both internal and external chucking and is adapted to receive bar work in one modification thereof. Internal and external chucking is accomplished by providing separate spaced apart jaw structures which are rotatable about separate axes parallel to and spaced radially from the axis of rotation of the chuck. An inclined slide is provided in each jaw structure actuated by bell crank means secured to the jaw structure for providing the pulldown feature. The bell cranks of the jaw structures are actuated by separate rods in accordance with rotation of an internally threaded ring gear engaged with external threads on the rods in one modification and in

accordance with a pull rod connected to an actuating member having portions engaged in recesses in the actuating rods in another modification.

27,324

## AUTOMOBILE SPEED CONTROL

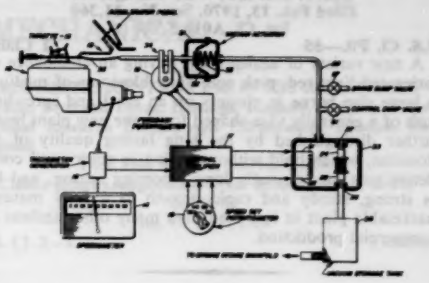
Cyrus M. Granger, Green Bay, Wis., Michael Slavin, Towson, and Ralph W. Carp, Baltimore, Md., and Peter St. C. Manson, Barrington, Ill., assignors to The Bendix Corporation, Baltimore, Md.

Original No. 3,381,771, dated May 7, 1968, Ser. No. 550,744, May 17, 1966. Application for reissue May 6, 1970, Ser. No. 34,951

Int. Cl. B60k *31/00*

U.S. Cl. 180—105 11 Claims

*A control amplifier combines a first electrical signal corresponding to desired automobile speed, a second electrical signal corresponding to actual automobile speed and a third electrical signal corresponding to throttle position so as to generate an error signal. The error signal is applied to a vacuum modulator which in response thereto provides to a vacuum motor a vacuum pressure related to the error signal. The vacuum motor is mechanically ganged to the throttle and controls throttle position.*



# PLANT PATENTS

## GRANTED MARCH 28, 1972

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,082

### POINSETTIA PLANT

Thormod Hegg, Lierbyen, Norway, assignor to Paul Ecke, Inc., Encinitas, Calif.

Filed Jan. 21, 1970, Ser. No. 4,787

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—86 1 Claim

1. A new and distinct variety of poinsettia plant, substantially as herein shown and described, characterized particularly as to novelty by being substantially identical in all respects to the poinsettia variety known as "Annette Hegg" (U.S. Plant Pat. No. 2,962) except for its bract color, with the bracts having a distinctive and attractive white color as essentially distinguished from the red bracts of the variety "Annette Hegg."

3,083

### MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Jan. 28, 1970, Ser. No. 5,604

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of hybrid miniature rose plant of hardy, moderately dwarf, much branched, upright, bush type, as illustrated and described, characterized by resemblance to the Cricri miniature rose (not patented) in general form of bud and flower (with less petals) but more nearly resembling Starina miniature rose (U.S. Plant Pat. No. 2,646) in color, the general color effect of the freshly opened flower being an all over orange red color of uniform shade with little tendency to fade, the flowers having extremely long lasting quality both on the plant and as cut flowers; and further characterized by a plant which is moderately dwarf, much branched and vigorous in growth, easy to propagate from cuttings and by buding; with medium small, dark green mildew resistant foliage, an abundance of bloom borne in repeated succession throughout the growing season with flowers borne usually in loose clusters on stiff wiry stems.

3,084

### MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Jan. 28, 1970, Ser. No. 6,605

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, rounded, much branched, bush type, as illustrated and described, characterized by resemblance to the Pink Cameo miniature rose (U.S. Plant Pat. No. 1,451) in general form of bud and flower but with color usually darker rose-pink in bud stage than Pink Cameo, the general color effect of the freshly opened flower being an all over pink or rose pink; further characterized by the flower buds having moss-like hairy appendages on bud surface which emits a fragrance whenever hairs (oil glands are rubbed or bruised; and further characterized by a plant which is vigorous and compact in growth, easy to propagate by building and from cuttings; with small medium green foilage, an abundance of bloom borne almost continuously throughout the growing season with flowers borne singly and in loose clusters.

3,085

### ALMOND TREE

St. Joseph Toy, Rte. 3, Box 73, Chico, Calif. 95926

Filed Feb. 9, 1970, Ser. No. 10,060

Int. Cl. A01h *5/03*

U.S. Cl. Plt.—30 1 Claim

1. A new and improved variety of almond tree characterized by more favorable bloom time, heavier bearing, higher kernel content, greater disease resistance, and more favorable harvest characteristics than present late maturing varieties.

3,086
AZALEA PLANT
Joseph H. Klupenger, Aurora, Oreg., assignor to Geo. J. Ball Inc., West Chicago, Ill.
Filed Feb. 13, 1970, Ser. No. 11,360
Int. Cl. A01h 5/00
U.S. Cl. Plt.—55 1 Claim

A new variety of azalea plant having an abundance of variegated light red, pink and white blossoms of medium to large size borne in clusters on an erect and spreading bush of a generally vase-shaped form; the new plant being further distinguished by the long lasting quality of its blossoms, which hold without fading in color until completely past an unusually long blooming season, and by its strong, sturdy and rapid growth to a fully mature, marketable plant in less time than many other azaleas in commercial production.

3,087
NECTARINE TREE
Chris Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351
Filed July 24, 1969, Ser. No. 844,672
Int. Cl. A01h 5/03
U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of nectarine tree as illustrated and described which bears large to medium, cling stone fruit having yellow flesh; characterized by ripening approximately 10 days earlier than the Grand River nectarine (Plant Pat. No. 1,248) and the Merrill Sunrise nectarine (Plant Pat. No. 1,256); and further characterized, in comparison with said other varieties, by heavier production of larger size fruits of red color shading to maroon which overspreads a yellow ground color.

3,088
ASH TREE
Richard Eugene Schlapfer, Arlington, Nebr., assignor to Marshall Nurseries, Arlington, Nebr.
Filed July 29, 1969, Ser. No. 845,920
Int. Cl. A01h 5/12
U.S. Cl. Plt.—51 1 Claim

This invention relates to a new and distinct variety of ash tree which is believed to be related to the species *Fraxinus pennsylvanica* (red ash). In contrast to this known variety the new variety (a) bears no flowers or fruit, (b) has less serrated leaflets which are broader and a darker green, (c) has longer petiolules, (d) has a slower growth habit which produces an ovoid more compact crown, (e) has rounded dark brown buds, (f) has leaf scars which are prominently notched at the upper margin, and (g) has resilient bark which can be depressed by pressure of the finger.

3,089
AZALEA PLANT
Hubert B. Lewis and Helen H. Lewis, both of 761 Country Hill Drive, La Habra, Calif. 90631
Filed Nov. 10, 1969, Ser. No. 875,600
Int. Cl. A01h 5/00
U.S. Cl. Plt.—56 1 Claim

1. A new and distinct variety of azalea plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of an attractive plant form, an usually large flower size for azalea flowers of the pink color class, a distinctive and attractive pink flower color, good keeping qualities of the flowers, particularly when pre-cooled, and flowers hold well under refrigeration, and excellent suitability for greenhouse forcing.

3,090
DOGWOOD TREE
Peter E. Costich, Center Moriches, N.Y., assignor to Treesearch, Kingston, N.J.
Filed Dec. 29, 1969, Ser. No. 889,005
Int. Cl. A01h 5/12
U.S. Cl. Plt.—51 1 Claim

1. A new and distinct variety of dogwood tree of the Japanese dogwood type, substantially as herein shown and described, characterized particularly as to novelty by its general similarity to typical varieties of the species botanically known as *Cornus kousa*, but being primarily distinguished therefrom by its prolonged and spectacular summer flowering habit, with its flowers retaining their white color and remaining unblemished from about mid-June to late August or mid-September, and said flowers being about 25% more abundant in average quantity and about 20% larger in average size in comparison with the normal flowers typical of the *Cornus kousa* species which fade in about two weeks after their normal June 10 to June 15 blooming date when grown under the same conditions in the same region of Central New Jersey and Southern New York.

3,091
ROSE PLANT
Samuel McGredy, % McGredy & Son Ltd., Portadown, Northern Ireland
Filed Dec. 29, 1969, Ser. No. 889,006
Int. Cl. A01h 5/00
U.S. Cl. Plt.—20 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class substantially as herein shown and described primarily characterized by:

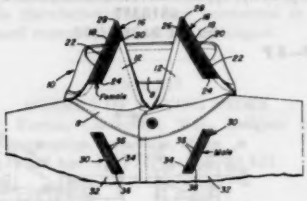
the flower is smaller than Karl Herbst with much clearer scarlet color, having a stronger neck and a more compact plant than most other red hybrid teas.

# PATENTS

## GRANTED MARCH 28, 1972

## GENERAL AND MECHANICAL

**3,651,519**
**CONCEALED COLLAR WING FASTENERS**
**Harold Glick, Elberta Ave., Salisbury, Md.**
**Filed July 14, 1970, Ser. No. 54,805**
**Int. Cl. A41b *3/00***
**U.S. Cl. 2—132** **2 Claims**



A "button-down" collar attached shirt wherein the collar has extra long pointed wings and wherein the pointed tips of the wings are provided with tapes which are alignable and mated with holddown tapes on the front of the shirt. The female tapes have loops arranged to accommodate flexible and resilient hooks on the coacting male tapes. These paired and oriented self-adhering tapes, when firmly pressed together, fasten tightly, hold the wings neatly in place and prevent unsightly wrinkling. These interconnected tapes can be easily and equickly peeled apart and separated, are capably adjustable and adaptable, and have been found to be ideal for the purposes desired.

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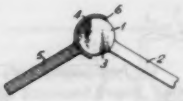
**3,651,520**
**MEN'S COAT**
**Oscar Ernst Otto Jacob, Weinberg, Germany, assignor to Greiff-Werke Gustav Winkler KG, Bamberg, Germany**
**Filed May 25, 1970, Ser. No. 40,336**
**Claims priority, application Germany, May 23, 1969, G 69 20 948.9**
**Int. Cl. A41d *27/02***
**U.S. Cl. 2—272** **3 Claims**

A lightweight suit coat for men's sportwear has an open-mesh netlike transparent fabric lining that is firmly secured to the surface area of the back of the coat's lining. The fabric has different size mesh in selective portions of the back. The fabric arrangement permits air to circulate through the coat.

**3,651,521**
**PROSTHETIC JOINT FOR USE IN THE HUMAN BODY**
**Michael Bertrand Devas, Hastings, England, assignor to National Research Development Corporation, London, England**
**Filed Feb. 5, 1970, Ser. No. 8,806**
**Claims priority, application Great Britain, Feb. 7, 1969, 6,803/69**
**Int. Cl. A61f *1/24***
**U.S. Cl. 3—1** **9 Claims**



A prosthetic device comprising mutually engageable male and female components to afford pivotal rotation in a plane, the female component including a socket member having a concave bearing surface with a cross section in said plane substantially in the form of a first circular segment subtending an angle greater than 180°, and a first shaft projecting from the rear of said socket member, and the male component including a head member having a convex bearing surface with a cross section in said plane substantially in the form of a second circular segment of equal radius to said first segment, subtending an angle significantly greater than said first segment, and relieved towards one end over a segmental angle of at least similar order to that by which said first segment exceeds 180°, and a second shaft projecting from the rear of said head member.

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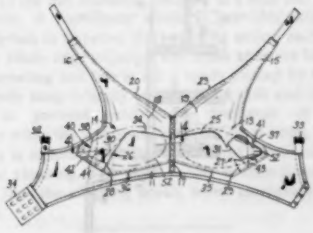
**3,651,522**
**PROSTHETIC BRASSIERE FOR USE AFTER SURGICAL BREAST REMOVAL**
**Isabel M. Bernfeld, Allendale, N.J., assignor to The Berger Brothers Company, New Haven, Conn.**
**Filed Apr. 23, 1970, Ser. No. 31,282**
**Int. Cl. A61f *1/00*; A41c *3/10***
**U.S. Cl. 3—36** **8 Claims**



A prosthetic brassiere for use after surgical removal of one or both breasts comprising a torso encircling member, a pair of breast cups in said member, each cup including a fabric liner conforming to the shape of said cup and adhered to said cup on the periphery thereof, the space between said cup and said liner defining a first pocket for holding breast simulating means, a first inverted V-seam across the exterior of each

cup, a second inverted V-seam across a portion of said liner, said first and second seams being superposed when said liner is pressed against the interior of said cup, a vertical seam separating said cups, a first slit in said liner for insertion of said breast simulating means, said first slit being an extension of the line of said second seam, and shoulder straps attached to said cups.

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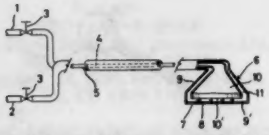
3,651,523

## SHOWER DEVICE PROVIDED WITH WATER HEATERS

Hideaki Miyahara; Tamiyosi Kawai, and Michio Takatsuki, Mito-City, all of Japan, assignors to Kabushiki Kaisha Hokusan, Sapporo City, Hokkaido, Japan

Filed July 28, 1970, Ser. No. 58,822
Claims priority, application Japan, Nov. 16, 1969, 44/91693
Int. Cl. A47k 3/22, 3/24
U.S. Cl. 4—145 4 Claims



In a shower device wherein a mixture of hot water from a water heater and cold water from a source of supply is supplied to a shower head through cocks, the shower head is provided with at least one hot water discharge port and at least one cold water discharge port. The hot water from the water heater is supplied to the hot water discharge port through a hot water conduit including a cock and the cold water is supplied to the cold water discharge port through a cold water conduit also including a cock whereby the hot water and cold water are admixed near the hot and cold water discharge ports of the shower device.

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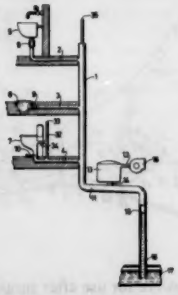
3,651,524

## VACUUM DRAIN SYSTEM

Lars-Erik Bengtsson, and Claes G. Allander, both of Stockholm, Sweden, assignors to AB Gustavsbergs Fabriker, Gustavsberg, Sweden

Filed Feb. 16, 1970, Ser. No. 11,764
Claims priority, application Sweden, Feb. 14, 1969, 2111/69
Int. Cl. E03d 9/04
U.S. Cl. 4—211 5 Claims



A sanitary drain system for a building in which a plurality of waste water drains are connected to a soil pipe and with the outlet end of the soil pipe being provided by a hydraulic closure. A vacuum is provided in the soil pipe and an inlet valve is provided in the connection between each waste pipe and the soil pipe. The inlet valve is of the type which is responsive to the vacuum in the soil pipe to remain closed in the absence of waste water in the drain at the inlet side of the valve. However, the inlet valve opens when there is water in the drain at the valve's inlet side so that waste water and also solid wastes can readily pass through the valve and thence through the soil pipe to the sewer.

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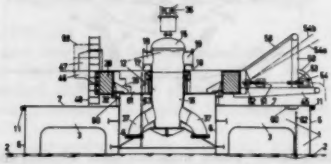
3,651,525

## ONE-POINT MOORING BUOY FOR LOADING OR UNLOADING SHIPS

Hendrikus S. Rutten, Voorburg; Gerard Kruisman, Reeuwijk; Johan DeGroot; Simon Westra, and Abraham P. Bavelaar, The Hague, all of Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed Dec. 5, 1969, Ser. No. 882,800
Claims priority, application Netherlands, Dec. 20, 1968, 6818357
Int. Cl. B63b 21/00
U.S. Cl. 9—8 P 3 Claims



Single buoy mooring for (un)loading tankers comprising a floating body anchored to the seabottom, a ring arranged on top of the body in such a way that it is rotatable around a vertical axis relative to the body and mooring cables or chains secured to the ring tangentially.

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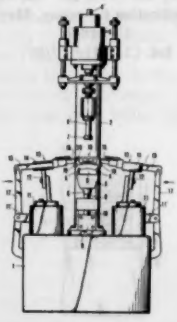
3,651,526

## LASTING DEVICE FOR SHOES

Takero Ogawa, No. 33–12, 4-chome, Kamineguro, Meguro-ku, Tokyo, Japan

Filed Mar. 3, 1970, Ser. No. 16,186
Int. Cl. A43d 21/00
U.S. Cl. 12—12 10 Claims



A lasting device for shoes. A machine stand has means supporting a wood last on its upper face at its center and has a support pillar standing upright on the back of the stand. A piston rod is mounted on the upper part of said support pillar and has a suitable device for moving said rod up away from and down toward the shoe last. A lasting mechanism is located on both sides of the shoe last in a freely reciprocating manner and is adapted to last the shank portion by pressing the leather placed over the last against the insole of the shoe.

A base plate is provided and is freely slidable in the direction of the toe of the shoe last and has a semicircular form open at the frontal portion thereof and having a corresponding circular stepped shoulder portion. A pair of platelike plungers are positioned within the shouldered portion on the base plate and together form a forwardly open generally semicircular notch and are freely pivotally connected to one another and oppositely rotatable so that the forward facing semicircular notch is made narrow following the sliding action of the base plate. A pair of fixed wiper plates is provided for lasting the toe portion and have a shape resembling the shape of the circular end of the toe part of shoes, and the circular edge corresponding to the circular shoulder portion for the platelike plungers. The wiper plates are securely attached to the platelike plungers. A pair of reciprocably movable wipers are respectively outwardly adjacent and hold the pair of fixed wiper plates therebetween and are connected in a freely resilient biased manner to the platelike plungers.

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**3,651,527**

## METHOD OF MAKING SHOES

**Anthony P. Forma, Claremont, N.H., assignor to Lowell Molding Corporation, Lawrence, Mass.**

**Filed Apr. 1, 1970, Ser. No. 24,621**
**Int. Cl. A43d** *13/18*
**U.S. Cl. 12—142 D** **1 Claim**

The method of making shoes, especially infants' shoes, which comprises molding the back part assembly of a shoe upper comprised of outer and inner plies with a counter material therebetween and wherein the lower edges of the plies and the counter material are substantially contiguous, to form at the lower edge inwardly and downwardly extending flanges, assembling the premolded upper with an insole having a rib at one broad side so that the inwardly extending flange engages the underside of the insole outwardly of the rib, the downwardly extending flange engages the outer side of the downwardly extending rib and the edge face of the insole engages the inner side of the back part, holding the inner edge of a welt strip engaged with the outer side of the downwardly extending flange and inserting fastening means through the inner edge of the welt strip, downwardly extending flange and rib.

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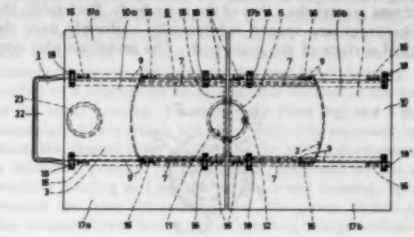
**3,651,528**

## FLOTATION DEVICE EQUIPPED WITH A ROAD-SECTION FOR THE CONSTRUCTION OF FLOATING BRIDGES OR MOTOR-FERRIES

**Georg Behrmann, Lauf A. D. Pegnitz, and Rudolf Schubart, Nurnberg, both of Germany, assignors to Dipl.-Ing. Karl Heinz Schmidt, Kreis Hersbruck, Germany**

**Filed Oct. 22, 1969, Ser. No. 868,360**
**Claims priority, application Germany, Oct. 22, 1969, P 18 04 498.9**
**Int. Cl. E01d** *1/00*
**U.S. Cl. 14—1** **14 Claims**

A float, preferably an amphibious vehicle for use in erecting pontoon bridges or powered rafts, is provided with a road section having rigid extensions pivotally connected to the longitudinal sides thereof for downward movement about axes parallel to the longitudinal axis of the road section with coupling means at its ends and being pivotable by power



means about an axis perpendicular to the road section of the vehicle.

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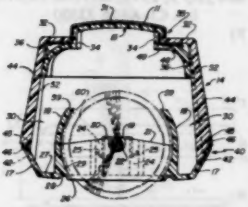
**3,651,529**

## CLEANING BRUSH

**Samuel J. Popeil, and Raymond Popeil, both of Chicago, Ill., assignors to Popeil Brothers, Inc., Chicago, Ill.**

**Filed Nov. 24, 1969, Ser. No. 879,278**
**Int. Cl. A47l** *11/00;* **A46b** *13/08*
**U.S. Cl. 15—4** **18 Claims**



A cleaning brush for fabric and upholstery is provided in which two opposed operating surfaces are presented: the first has a rotating brush which will sweep crumbs and dirt from upholstery or carpeting and entrap the same within the housing; and the second, a reverse side, containing an oriented cloth which will remove from upholstery, carpeting, and other fabrics, lint, cotton and tangle fibers which cannot be readily engaged by the sweeper. An interlocking construction is provided which effectively isolates the entrapped dirt picked up by the rotating brush from the oriented cloth, and at the same time serves to physically interlock the fabric into the back of the dirt retaining member in a dust and leakproof engagement. A curvilinear shield is provided adjacent the rotating brush to improve the sweeping action and retention of dirt. A blade edge adjacent the brush aperture loosens the dirt in carpeting and fabric for a ready pickup by the brush. A case body snap-actingly engages the brush and dirt holder portion to prevent inadvertent discharge of retained sweepings while the oriented cloth portion is being used. The case body is squeezed for the removal of the brush and dirt holder for cleaning. The cloth holder is snap-fitted into the case and thus the cleaning brush, when assembled, has only two parts.

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**3,651,530**

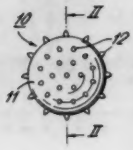
## MEANS FOR CLEANING PIPELINES

**Ronald W. Schultz, Lodgepole, Alberta, Canada**

**Division of Ser. No. 751,844, Aug. 12, 1968, Pat. No. 3,573,985**
**Filed Dec. 8, 1970, Ser. No. 96,187**
**Claims priority, application Canada, Aug. 15, 1967, 997884**
**Int. Cl. B08b** *9/04*
**U.S. Cl. 15—104.06 R** **17 Claims**

A pipeline-cleaning travelling "pig" ball having a generally spherical main body formed of a resiliently deformable

material. The main body of the ball is provided with plurality of discrete, discontinuous, spaced-apart protuberances upstanding from the surface thereof; the protuberances being of a hardness greater than that of the main body. Preferably, the protuberances are spaced substantially uniformly over the spherical surface of the main body. The invention also con-




templates the provision of a pipeline-cleaning kit comprising a first lead "pig" ball and a second follower pig ball; the second or follower pig ball having a main body formed of a resiliently deformable material having a hardness greater than the hardness of the main body of the first or leading pig ball.

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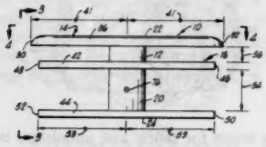
**3,651,531**
**BROOM GUIDE**
**Billy J. Wietelman, Rt. Box 196, Guthrie, Okla.**
**Filed July 2, 1970, Ser. No. 51,974**
**Int. Cl. A46b *15/00***
**U.S. Cl. 15—171** **16 Claims**



A broom guide adapted to facilitate the manufacture of broom assemblies, which includes a base adapted to be secured to a lower end portion of a broom handle. The base includes, a form guide, a first guide bar assembly, and a second guide bar assembly, all of which are secured to the base. The form guide is sized to provide the basic shape about which the final layer of broom corn is formed. The first and second guide bar assemblies are each shaped and disposed to provide a space there between, the space being to accommodate a predetermined amount of broom corn. The first and the second guide bar assemblies are also shaped to accommodate the wire banding, which is utilized to secure the broom corn disposed in the space between the first and the second guide bar assemblies to the broom handle.

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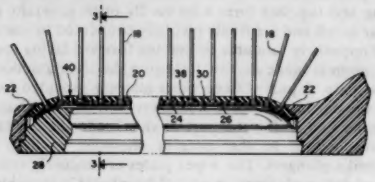
**3,651,532**
**WIG BRUSH**
**Jochen Wettburg, Beerfelden, Odenwald, Germany, assignor to Braun, Wettberg & Co., Beerfelden, Odenwald, Germany**
**Filed May 13, 1970, Ser. No. 36,912**
**Int. Cl. A46b *3/20***
**U.S. Cl. 15—186** **6 Claims**

A wig brush having a plurality of metallic bristles anchored to a pliable cushioning material for providing flexible support for the bristles. The cushioning material is mounted to the brush by inserting same through an elongated aperture in the brush frame. A convex forming piece is snap fit into the elongated aperture to firmly secure the cushioning material against a peripherally extending lip surrounding the aperture to thereby snugly retain the cushioning material within the aperture. The forming piece is adapted to flex the cushioning material so that it will assume a curved contour extending outwardly from the aperture and will also provide an air




space between the cushioning material and the convex surface of the forming piece.

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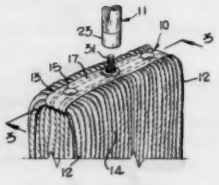
**3,651,533**
**MOP HEAD CONSTRUCTION**
**James R. Bouras, St. Louis, Mo., assignor to Bouras Mop Mfg. Co., St. Louis, Mo.**
**Filed May 13, 1970, Ser. No. 36,710**
**Int. Cl. A47l *13/24***
**U.S. Cl. 15—229 A** **3 Claims**




This mop construction includes a flat bundle of parallel mop cords connected by a tape wrapped around the center portion. The taped connection is reinforced by a transverse clamping plate which is shorter than the width of the taped cord bundle to provide the mop with lateral cushioning pads. The clamping plate is disposed below the mop bundle and the fastening between the clamping plate and the taped bundle provides an elongate stem extending through the mop bundle and providing rigid attachment for the mop handle.

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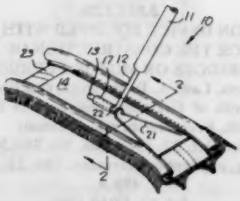
**3,651,534**
**CLEANING DEVICE WITH INTERCHANGEABLE HEAD**
**Ragnvald G. Leland, 2334 W. 241st St., Lomita, Calif.**
**Filed Aug. 14, 1970, Ser. No. 63,806**
**Int. Cl. A47l *13/46***
**U.S. Cl. 15—231** **5 Claims**



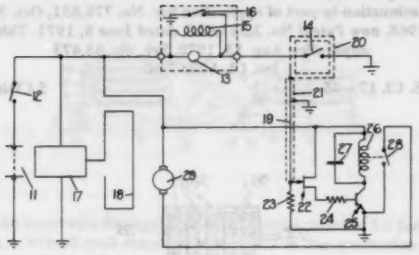

A cleaning device having an interchangeable head including a handle and a pad. A resilient holding member releasably securing the pad to the head and simultaneously releasably secures the handle to the head.

3,651,535

## ELECTRICAL SYSTEMS FOR ROAD VEHICLES

John Granville Baldwin, Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 9, 1970, Ser. No. 53,383
Claims priority, application Great Britain, Aug. 11, 1969, 40,007/69
Int. Cl. B60s *1/02*
U.S. Cl. 15—250.02 1 Claim



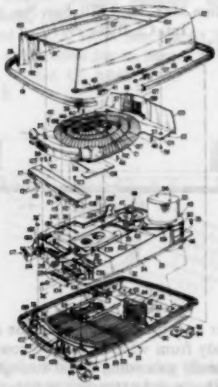
In an electrical system for a road vehicle, a manually operable switch controls one electrical circuit of a vehicle. The switch has a metallic part associated with it, and this metallic part acts as the sensing element of a proximity switch which controls another electrical circuit of the road vehicle. One circuit may be the windshield wiper circuit, and the other the windshield washer circuit.

3,651,536

## CANISTER VACUUM CLEANER WITH RETRACTABLE HOSE

James J. Bolzan, Jr., 406 Belnewood Lane, and Charles T. Fromknecht, 2007 College Ave., both of Anderson, S.C.

Filed Jan. 8, 1970, Ser. No. 1,498
Int. Cl. A47l *9/00*
U.S. Cl. 15—323 7 Claims



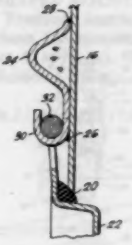
A vacuum cleaner of the canister variety for domestic use having lower and upper housings secured together by U-shaped clips, and an intermediate housing. Between the upper and intermediate housings is disposed a hose storage compartment within which the hose is coiled when the cleaner is not in use. A spring motivated hose reel mechanism retracts the hose into its stored position upon depression of a foot pedal. The spring is wound into an energized condition by extracting the hose from the storage area. A pawl and ratchet mechanism maintains the spring in its energized condition until the pedal is depressed. Also disclosed is a selectively operable lever controlled slide valve for converting the cleaner from suction to blower operation and vice versa. A dust bag, located within the vacuum chamber between the intermediate and lower housing, is attached to a bracket on an access door located at the bottom of the lower housing. To change the filter bag and a pair of secondary filters which are also removably mounted on the door, the cleaner is set on end and the access door opened to a table-like position. A front panel, mounted on the intermediate housing and secured to the lower housing, operably mounts the hose retraction pedal, the power switch pedal, the suction/blower levers and a filter bag change indicator.

3,651,537

## DOOR HINGE ASSEMBLY FOR BINS

Dwight E. Nichols, Beatrice, Nebr., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed Aug. 19, 1969, Ser. No. 851,337
Int. Cl. E05d *9/00, 1/06;* B65d *43/16*
U.S. Cl. 16—128 3 Claims



An improved hinge assembly for mounting a discharge door on the front wall of a large bin capable of transporting and storing bulk material. The hinge assembly consists of a generally S-shape hinge bar which is secured to the front wall of the bin and terminates at its lower end in a plurality of depending generally U-shape supports which are spaced apart in a horizontal direction. A hinge rod which supports the door is rotatably supported in the depending supports on the hinge bar.

3,651,538

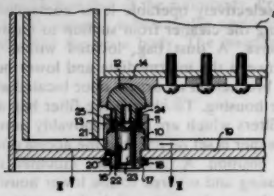
## PIVOTABLE SUPPORT FOR A DOOR OR ANALOGOUS SWINGABLE ELEMENT

Dietrich Jentsch, Ennepetal-Voerde, Germany, assignor to Dorken & Mankel KG, Ennepetal-Voerde, Germany

Filed Oct. 8, 1970, Ser. No. 79,148
Claims priority, application Germany, Oct. 17, 1969, P 19 52 411.9
Int. Cl. E05d *2/04*
U.S. Cl. 16—134 10 Claims

A stationary tubular guide member has a upwardly directed open end and a vertically oriented longitudinal axis. A pivot pin has an upper portion projecting above the open end for engaging and supporting a swingable element, an intermediate portion between the upper portion and the open end, and a lower portion located within the guide member with limited freedom of axial displacement therein. A retaining pin prevents the pivot pin from turning with reference to the guide member. A downwardly open cap surrounds with its upper section the intermediate portion of the pin and with its lower section the guide member. Cooperating screw

threads on the intermediate portion of the pin and on the upper section of the cap permit rotation of the latter with



reference to the pin with a concomitant axial displacement of the latter relative to the guide member.

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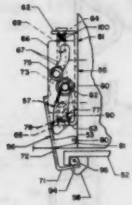
**3,651,539**
**DOOR HINGE**
**Theodore R. Breunich, Stanford, Conn., and Henry B. Klatte, Yonkers, N.Y., assignors to Universal Oil Products Company, Des Plaines, Ill.**
**Filed Oct. 5, 1970, Ser. No. 77,787**
**Int. Cl. E05d *9/00***
**U.S. Cl. 16—128** **9 Claims**



A hinge which in the closed position thereof is completely set back from the outer surface of the framing encompassing a door associated with the hinge and which permits substantially 180° of rotation of the door to an open position. The hinge is comprised of a hinge member which is movably connected to a support bracket. Restraining means is provided for maintaining the hinge member in a first predetermined position whereby the door can be rotated to the closed position. Releasing means is provided for freeing the movable hinge member from the restraining means whereby it can be moved to a second predetermined position permitting substantially 180° rotation of the door to the open position thereof.

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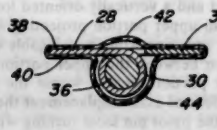
**3,651,540**
**ENCASED HINGE**
**Sudhir N. Rana, 116 Nob Ave., Del Mar, Calif.**
**Filed Sept. 28, 1970, Ser. No. 76,155**
**Int. Cl. E05d *11/00***
**U.S. Cl. 16—148** **5 Claims**




One aspect of the invention comprises a composite hinge structure, including a piano type hinge and a flexible sealing membrane on opposite sides of the hinge. Another aspect of the invention comprises two strips of flexible sealing membranes. A plurality of leaf type hinges are spaced along and between the strips. The leaves of the hinges are fixed in sealing relationship with the strips.

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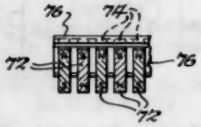
**3,651,541**
**METHOD OF GUIDING PIERCING INSTRUMENTS**
**Andre Robert Jaccard, Buffalo, N.Y., assignor to Jaccard Corporation, Erie County, N.Y.**
**Continuation-in-part of application Ser. No. 776,851, Oct. 31, 1968, now Patent No. 3,583,025, dated June 8, 1971. This application Aug. 13, 1970, Ser. No. 63,473**
**Int. Cl. A22c *7/00***
**U.S. Cl. 17—45** **5 Claims**




Magnetic bars are used to guide knives or other piercing instruments in machines, such as meat tenderizers, where the piercing instruments are repeatedly thrust deeply into a body and then withdrawn. Thus, the instruments are firmly, but yieldingly, guided to maintain the desired alignment and spacing and minimize bending and breaking thereof.

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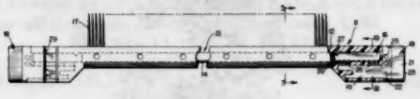
**3,651,542**
**FALLER BARS**
**Matthew Kenneth Mann, Shipley, and Norman Rushworth, Baildon, both of England, assignors to Plastex Limited, Dublin, Ireland**
**Continuation-in-part of application Ser. No. 702,333, Feb. 1, 1968, now Patent No. 3,532,077, dated Oct. 6, 1970. This application Mar. 16, 1970, Ser. No. 19,947**
**Int. Cl. D01g *19/10***
**U.S. Cl. 19—129 R** **11 Claims**



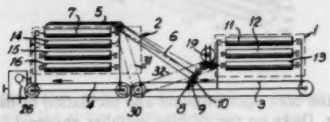
A faller bar for a textile combing machine comprises an integral plastic body from which extend a row of metal comb pins, a longitudinally extending metal strengthening member imbedded in the body and extending at opposite ends beyond the row of pins at each end of said body to be directly mechanically secured to respective fixed metal mounting plates that cooperate with parts of the textile machine; and a notched or similarly formed region in said strengthening member provides a weakened connection that maintains the strengthening member attached to the end plates during normal operation but permits relative flexing of or separation between the strengthening member and end plates when more than a predetermined torque is applied.

3,651,543

## APPARATUS FOR TREATING CARDED FIBROUS MATERIAL FOR FORMING A WEB OF SAID MATERIAL

Madis Valdurovich Loo, Mustamyae tee 173, kv. 34; Argo Alexandrovich Siliaots, ulitsa Keemne, 6, and Jury-Eduard Khansovich Kekhler, ulitsa Tekhnika 99, kv. 6, all of Tallin, U.S.S.R.

Filed May 8, 1969, Ser. No. 823,015
Int. Cl. D04h 11/04
U.S. Cl. 19—161 R 2 Claims



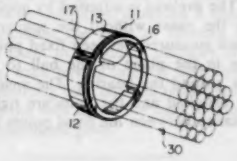
An apparatus for treating carded fibrous material for forming a web of such material, to be used in the production of nonwoven textile materials, wherein, in addition to two systems of longitudinal conveyors and a pair of aligned transverse conveyors disposed under these two systems of longitudinal conveyors, there are provided a device for turning a lap of fibrous material by 90°, disposed above the second one of the two systems of longitudinal conveyors, and a pair of additional conveyors. One of these two additional conveyors is inclined toward the transverse conveyor which is disposed under the first system of longitudinal conveyors and is itself disposed intermediate the two systems of longitudinal conveyors, the other of these two additional conveyors being disposed between the device for turning the lap of fibrous material by 90° and the second one of the two systems of longitudinal conveyors, the direction of travel of this last-mentioned one of the two additional conveyors being opposite to that of the topmost one of the conveyors of the second system.

3,651,544

## GRIPPING BAND FOR BUNDLE OF WIRES

Yoshio Soma, Tokyo, Japan, assignor to Nikko Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1970, Ser. No. 61,366
Claims priority, application Japan, Mar. 12, 1970, 45/23270
Int. Cl. A44b 21/00
U.S. Cl. 24—16 R 3 Claims



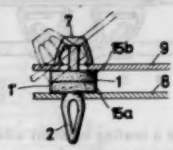
A combination of a resilient inner ring having a portion cut away to form an expansible gap and a resilient outer ring similarly having a portion cut away to form an expansible gap. The outer ring is slidably received in a circumferential groove formed in the outer peripheral surface of the inner ring. The inner ring is provided with an axial ridge on the inner surface thereof for preventing relative rotation of a bundle of wires gripped thereby and with an axial ridge on the outer surface thereof across the circumferential groove for engagement with one end of the outer ring to prevent relative rotation of said inner and outer rings.

3,651,545

## BINDING DEVICE FOR FASTENING TWO PLATES

Kunio Hara, Sagamihara, Japan, assignor to Nifco, Inc., Tokyo, Japan

Filed Sept. 25, 1970, Ser. No. 75,586
Claims priority, application Japan, Sept. 27, 1969, 44/91683
Int. Cl. A44b 21/00
U.S. Cl. 24—73 P 6 Claims



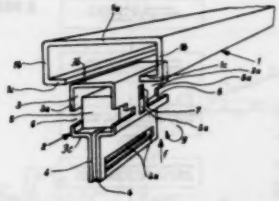
A binding device made of synthetic resin for fastening two plates at a given fixed distance, which device comprises a flange, a pin member erected on one side of the flange and a check member erected on the other side thereof.

3,651,546

## FASTENING ELEMENT DEPENDENTLY SUPPORTED FROM A C-SHAPED MOUNTING MEMBER

Manfred Hartmann, Frastanz, Austria, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Oct. 9, 1970, Ser. No. 79,374
Claims priority, application Germany, Oct. 17, 1969, P 19 52 431.3
Int. Cl. A44b 21/90; E21f 17/02; A47f 5/00
U.S. Cl. 24—73 SA 25 Claims



A fastening element for dependently supporting pipe clamps and similar devices from an elongated C-shaped mounting member includes an elongated tubular-shaped member containing a resilient body formed of an elastically deformable material, such as rubber. The tubular-shaped member has a pair of slotted side walls and its dimensions relative to the C-shaped mounting member are such that it can be inserted through the opening formed by the mounting member and then rotated until the slotted portion of its side walls bear on the mounting member. Further, when the tubular member is supported within the mounting member, the resilient body is in deformed contact with the mounting member for holding the tubular-shaped member in its supported position.

3,651,547

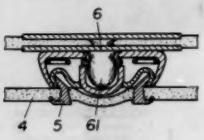
## SOCKET MEMBER OF SNAP FASTENER

Hidenosuke Ishizaki, 289-46, Kitahata Motoyama-cho, Higashinada-ku, Kobe, Japan

Filed July 21, 1970, Ser. No. 56,919
Int. Cl. A44b 17/00
U.S. Cl. 24—218 2 Claims

A socket member comprises a main body, a resilient bent wire and a seating element for enclosing the resilient bent

wire in the main body. At least two straight portions of the resilient wire spaced apart in parallel by a desired distance are disposed in a recessed portion of the main body for receiving the head of a stud member so as to retain the stud head in engaged position in clamping contact therewith. The




socket member has a seating element which is provided with walls defining an annular inclined groove and secured within the body in spaced relation to the bent wires by abutment with the stud receiving portion and the outer walls of the body, so that said seating element receives and effects the upsetting of the prongs of a pronged attaching member.

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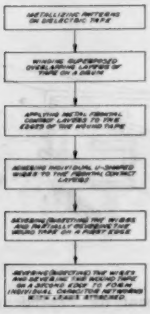
**3,651,548**

## CAPACITIVE NETWORK

**Reinhard Behn, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

**Filed Aug. 3, 1970, Ser. No. 60,517**
**Claims priority, application Germany, Aug. 6, 1969, P 19 40 036.3**
**Int. Cl. H01g *13/06***
**U.S. Cl. 29—25.42** **3 Claims**



A capacitive network particularly suited for radio frequency shielding is formed as a layer or stack type condenser having a gap cut therein normal to the planes of the layers to divide the structure into stack portions. Adjacent groups of dielectric and metallic coating layers form ranges of capacitance wherein each range includes internal series capacitive circuits interconnected by bridging coatings between the stack sections in accordance with desired capacitance circuit configurations.

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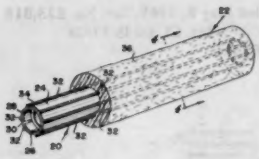
**3,651,549**

## PLATE RUBBING MEMBER FOR LITHOGRAPHIC PLATE DEVELOPING MACHINE

**Edward A. Casson, Jr., Airpark Drive, Easton, Md.**

**Filed July 28, 1969, Ser. No. 845,446**
**Int. Cl. B21b *31/08***
**U.S. Cl. 29—129** **6 Claims**

A plate rubbing member for a lithographic plate developing machine which includes a core of tubular conformation. A plurality of spaced rods are secured to the outer periphery of the core and extend longitudinally thereof. The exterior surface of each rod is provided with a friction surface. A tubular member of yieldable absorbent material is sleeved over the core and the friction surfaces of the rods grip the inner periphery of the tubular member in a manner to prevent rotary and longitudinal movement of the tubular member rela-



tive to the core upon rotation and oscillation of the rubbing member. Disks on the rubbing member engageable with the terminals of the tubular member positively preclude the absorbent material from sliding back and forth on the core during oscillating movement of the rubbing member.

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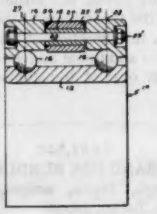
**3,651,550**

## METHOD OF PRELOADING A BEARING

**John E. R. Bennett, Palos Verdes Peninsula, Calif., assignor to The United States of America as represented by the Secretary of the Air Force**

**Filed Aug. 19, 1970, Ser. No. 65,043**
**Int. Cl. B23p *11/00***
**U.S. Cl. 29—148.4 A** **1 Claim**



A method of preloading a bearing wherein races are made of steel, and spacers between the races are made of a more elastic material, such as aluminum, with the desired preload being provided by preload bolts passing through the races and spacers. The preload is adjusted by applying the desired axial load to the races without the spacers installed. The distance is then measured between fixed points on the races approximately in the plane of the ball to race contact at several points around the bearing. The spacers and closure ring are then installed and the bolts are tightened until the measured distance between the fixed points on the races are reached.

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**3,651,551**

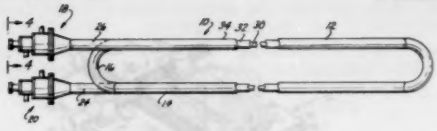
## HEADER STRUCTURE FOR HEAT TRANSFER APPARATUS

**Robert B. Cannon, 40 Woodhull Pl., Northport, N.Y.**

**Filed Feb. 26, 1970, Ser. No. 14,576**
**Int. Cl. B21d *53/00*; B21k *29/00*; B23p *15/26***
**U.S. Cl. 29—157.3 C** **3 Claims**

An improved header construction for a heat transfer apparatus is provided. The header includes a plurality of connected longitudinally stepped concentric annular rings each adapted to be coupled to the base of a hollow frustoconical member. The top end of each of the frustoconical members

is secured to one tube of a plurality of concentric tubes proximal an end of that tube. A method of assembling a heat



transfer apparatus utilizing an improved header in accordance with the above is also provided.

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**3,651,552**

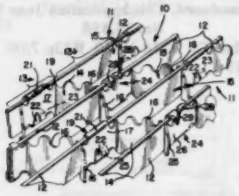
**METHOD OF MAKING RETICULATED BAR GRATING**

**John W. Allen, Flossmoor, Ill., assignor to Stanray Corporation, Chicago, Ill.**

**Original application Aug. 30, 1968, Ser. No. 756,684. Divided and this application May 25, 1970, Ser. No. 40,164**

**Int. Cl. B23p *15/12***

**U.S. Cl. 29—160** **6 Claims**



A bar grate and the method of making the same. The bar grate includes a reticulated grate made from a unitary flat sheet and a plurality of lengthwise extending and transversely spaced bars fastened thereto within saddles formed during the making of the reticulated grate. The saddles include projecting tab portions which are folded over and retain the bars in the grate so that no additional fastening is required.

The method includes the steps of forming a reticulated grate from a flat sheet to provide a plurality of lines of bar receiving saddles, each having integral therewith tab fastening means, and inserting bars into the respective lines of saddles and bending the tabs about the bars to retain the latter fastened to the reticulated grate.

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**3,651,553**

**BEARING RACE DRIVER**

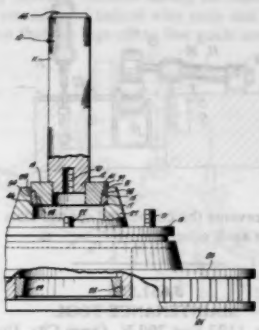
**Russell O. Dodd, 1010 North Vernon Pl., Azusa, Calif.**

**Filed Oct. 8, 1970, Ser. No. 79,047**

**Int. Cl. B23p *19/04*; B25b *27/14***

**U.S. Cl. 29—201** **10 Claims**

A driving tool having a drive handle with a reduced diameter boss to which any one of a plurality of drive collars is attachable. Each collar has a central bore which makes a snug fit with the driver boss and a shoulder adapted to contact the outer face of a friction bearing race. The shoulder abuts a frustoconical exterior wall adapted to fit within the tapered race. The shoulder has an outer diameter slightly less than the outer diameter of the race. A threaded bore in the boss end of the driver affords means for attaching a suspension at-



tachment for suspending the drive collar and race within a housing bore until the race is properly positioned to be driven.

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**3,651,554**

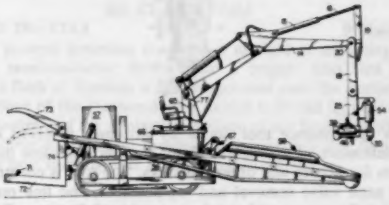
**NAILED BOARD REMOVING DEVICE**

**Francis A. Herbert, P.O. Box 81, Schriever, La.**

**Original application May 12, 1969, Ser. No. 830,184, now Patent No. 3,525,503, dated Aug. 25, 1970, Continuation-in-part of application Ser. No. 590,907, Oct. 31, 1966, now abandoned. Divided and this application May 4, 1970, Ser. No. 46,579**

**Int. Cl. B23p *19/00***

**U.S. Cl. 29—200 B** **6 Claims**



An apparatus for salvaging nailed boards used in the building of temporary roads over marsh land etc. The apparatus includes a frame having a fixed and a movable jaw adapted to grip a board therebetween and a rocker heel member about which said jaws are pivoted to raise the board from its support. Means are provided to close the jaws and pivot the frame about the rocker heel. The apparatus also includes a shaker conveyor for advancing thus removed boards to a nail bending device and thence to a board stacking device.

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**3,651,555**

**APPARATUS FOR AUTOMATICALLY CONNECTING SHUTTER SLAT AND PREVENTING ITS DISENGAGEMENT**

**Hiroshi Kataoka, 12, NaKa 1-chome, Owada, Nishiyodogawa-ku, Osaka, Japan**

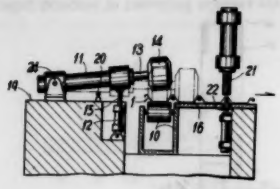
**Filed Sept. 16, 1970, Ser. No. 72,732**

**Int. Cl. B23p *19/04***

**U.S. Cl. 29—208 D** **1 Claim**

Apparatus for automatically connecting shutter slat and preventing its disengagement, which automatically connects

one shutter slat with another having a notch and slots for preventing its disengagement and cut in the specified dimension, and also prevents the connected shutter slats from being disengaged from each other.



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**3,651,556**

## MAINTENANCE TOOL

**John L. Mechan, 1193 East 200 N., Orem City, Utah**

**Filed May 15, 1970, Ser. No. 37,624**
**Int. Cl. B23p *19/04***
**U.S. Cl. 29—213** **9 Claims**

A maintenance tool usable by workmen involved in the maintenance of hydraulic systems such as water-line installations for homes and other buildings. The tool is constructed for each valve removal and replacement, and line removal and replacement, without the necessity of shutting off water pressure relative to the main or branch line affected. Flared guide means is employed in the tool for directing water streams centrally of the tool for proper valve or other installations.

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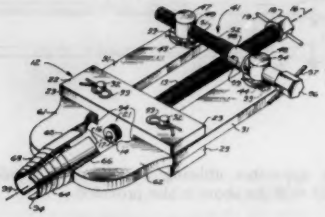
**3,651,557**

## OIL SEAL PULLER

**Millard Bagley, 6267 Pentz Road, Paradise, Calif.**

**Filed Mar. 27, 1970, Ser. No. 23,361**
**Int. Cl. B23p *19/04***
**U.S. Cl. 29—260** **5 Claims**

A chassis includes a pair of arcuate in section pivoted jaws dimensioned so as to encircle with some clearance the portion of a crankshaft projecting from the block of an internal combustion engine. The ends of the jaws are tapered and serrated so that upon being urged toward the block they are forcefully and securely interposed between the crankshaft and the encircling resilient member of an oil seal. The oil seal is lodged within the customary oil seal well formed in the block where the crankshaft emerges from the block. Thus, when the two jaws are thereafter spread apart with substantial force, and the two adjacent portions of the resilient seal member are deformed radially outwardly, the gripping effort between the serrated jaws and the resilient seal member is so great that the seal can thereafter be moved axially out of its well. Axial movement is effected by rotation of a threaded axial stem having a thrust shoulder bearing against the outer end of the crankshaft, the threaded stem being in threaded engagement with the chassis so as to afford selective relative movement between the chassis and the serrated jaws on the one hand and the outer end of the crankshaft on the other hand.



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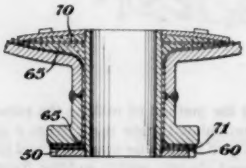
**3,651,558**

## METHOD OF REPAIRING A CERAMIC-LINED NOZZLE

**Raymond Burt Chase, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Continuation-in-part of application Ser. No. 726,034, May 2, 1968, now abandoned. This application June 8, 1970, Ser. No. 35,558**
**Int. Cl. B22d *19/10*; B23p *7/00***
**U.S. Cl. 29—401** **3 Claims**




In a glass or ceramic-lined reactor vessel for use with corrosive contents, to repair major damage of a nozzle, damaged portions of the nozzle are first removed as by cutting torch, the remaining nozzle neck wall is edge-tapered for welding, a replacement nozzle opening comprising a flange is provided and attached by welding inside and out, any surplus inside bead or rod slag being brought to a conforming surface; the nozzle and adjacent portions of the reactor vessel are sheathed with a metal cover, the metal being from one-eighth to one-half inch, both inclusive, in thickness, and being such as is substantially inert under the conditions of use of the equipment being repaired; the cover comprising essentially an outer face disc and an inner face disc each defining a threaded central opening, a tubular nozzle interior sheath, the ends of the nozzle interior sheath and the inner aspects of the openings of the discs being cooperatively threaded; any space otherwise void between repair sheath and nozzle interior surface being filled with a curable resin filler that is inert and insoluble when cured; the nozzle being drawn securely into place and cooperating deformable chemically gaskets being deformingly seated, by tightening of especially the threaded outer face disc onto the threaded tubular sheath.

3,651,559

## MANUFACTURING A SEAMLESS PRESSURE VESSEL

Andrew W. Lawlor, Erie, Pa., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Apr. 13, 1970, Ser. No. 27,785
Int. Cl. B23p *17/00*; B21h *1/14*
U.S. Cl. 29—422 8 Claims

Improved method of manufacturing metallic seamless spherical pressure vessel wherein the vessel is controllably worked and heat treated during fabrication in such fashion that the final vessel has no localized weakened areas and full advantage is taken of the spherical shape of the vessel.

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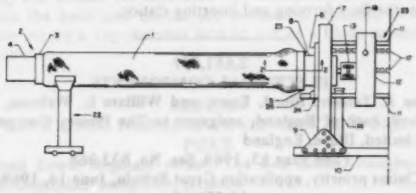
3,651,560

## METHOD OF MAKING A RESIN IMPREGNATED FILAMENT WOUND ARTICLE

Russell J. Phillips, Delafield, Wis., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed June 25, 1970, Ser. No. 49,639
Int. Cl. B23p *17/00*
U.S. Cl. 29—423 4 Claims



An improved method of making a filament wound article. The mandrel upon which the article is filament wound is first fitted with an annular collar at an end thereof. The article is produced by winding resin impregnated filaments about the mandrel with filaments bearing against the annular collar. A mandrel extracting device is used to remove the mandrel from the filament wound article produced. The mandrel is drawn through an aperture in a pressure surface on the mandrel extracting device, the aperture having a diameter larger than that of the mandrel but smaller than the outer diameter of the annular collar. The annular collar thereby bears against the pressure surface and the annular collar and the filament wound article are forced off the mandrel.

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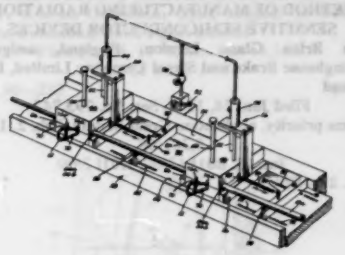
3,651,561

## METHOD FOR ASSEMBLING A LINE GUIDE TO A FISHING ROD

Barry D. Cousin, Walkerton, Ind., assignor to Plas/Steel Products, Inc., Walkerton, Ind.

Filed Apr. 20, 1970, Ser. No. 30,133
Int. Cl. B23p *11/02*
U.S. Cl. 29—450 4 Claims

This invention relates to a method for attaching a line guide to a fishing rod. The line guide has two collinearly extending legs flush with the surface of a fishing rod securely affixed thereto by means of preformed helical wire coils surrounding both the legs and the rod. The method and apparatus for attaching the line guide to the rod includes a pair of relatively movable fixtures having die cavities adapted to receive an assembly of helical wire coils and a line guide in such position that the legs of the line guide are fitted into the



coils. The fixtures are provided with collinear die bores through which may be inserted in succession a tapered rod, the die bores being in registry with the wire coils such that the rod can pass therethrough. The rod is forced into tight engagement with the coils relative movement between the fixtures facilitating engagement first with the coils in the recess of one fixture and secondly with the coils in the recess of the other fixture.

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3,651,562

## METHOD OF BONDING SILICON TO COPPER

Kenneth G. Hambleton, Baldock, England, assignor to National Research Development Corporation, London, England

Filed Nov. 25, 1969, Ser. No. 879,895
Claims priority, application Great Britain, Nov. 30, 1968, 56,981/68
Int. Cl. B23k *31/02*
U.S. Cl. 29—473.1 9 Claims

The present invention concerns a method of mounting a silicon semiconductor device onto a copper heat sink in which a flash of titanium is first evaporated onto the contacting surface of the semiconductor device followed by coating the titanium and the contacting surface of the heat sink with either silver or gold and bonding the semiconductor device and the heat sink together by thermo-compression.

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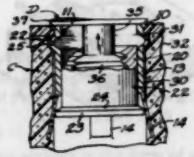
3,651,563

## DOUBLE ANCHORING MECHANICAL SANDWICH PANEL FASTENER INSERT

Josef F. Volkmann, Tustin, Calif., assignor to Shur-Lok Corporation, Santa Ana, Calif.

Filed Dec. 18, 1969, Ser. No. 886,292
Int. Cl. E04c *2/36*; F16b *39/22*
U.S. Cl. 29—523 3 Claims



A fastener insert which develops clamping anchorage to a panel skin by forming a bulbed secondary head in a shell by

compression resulting from drawing a nut into the shell under interfering engagement between the two, and secondary anchorage in the panel core by a plurality of petals which are expanded into the core by action of an annular head on the nut as the nut is drawn into the shell.

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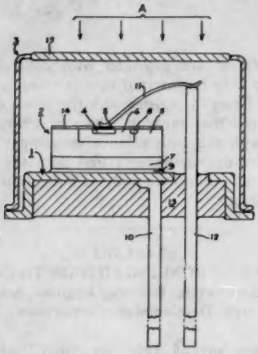
3,651,564

## METHOD OF MANUFACTURING RADIATION-SENSITIVE SEMICONDUCTOR DEVICES

William Brian Glass, London, England, assignor to Westinghouse Brake and Signal Company Limited, London, England

Filed Jan. 24, 1969, Ser. No. 793,742
Claims priority, application Great Britain, Feb. 2, 1968, 5,361/68
Int. Cl. B01j 17/00; H01l 7/00
U.S. Cl. 29—574 7 Claims



A method of manufacturing semiconductor devices of the type including a radiation-sensitive region wherein the radiation-sensitive region of each device is purposely made to have a sensitivity greater than a required sensitivity. The sensitivity of each device is then determined and a translucent screen is provided for the device, the translucence of the screen being dependent upon the radiation sensitivity of the particular device.

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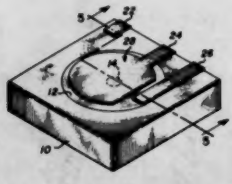
3,651,565

## LATERAL TRANSISTOR STRUCTURE AND METHOD OF MAKING THE SAME

David V. Talbert, Santa Cruz, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sept. 9, 1968, Ser. No. 758,340
Int. Cl. B01j 17/00; H01l 7/24
U.S. Cl. 29—590 6 Claims



A process for making a lateral PNP semiconductor device having a $\beta$ within the range of 5 to 500 wherein, during a heating stage, a metallic layer is left covering the surface of the water above substantially all of the base region separating the emitter and collector regions. The resultant effect is to cause a marked increase in the current gain of the transistor thus constructed over those similar devices manufactured in accordance with prior art processes.

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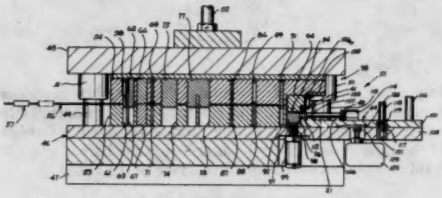
3,651,566

## METHODS OF FORMING AND ASSEMBLING ARTICLES WITH A SUPPORT

Jack W. Kincaid, Heath, and Michael M. Simpson, Columbus, both of Ohio, assignors to Western Electric Company Incorporated, New York, N.Y.

Filed May 26, 1969, Ser. No. 827,647
Int. Cl. H01f 7/05; H01r 9/00
U.S. Cl. 29—602 7 Claims



A plurality of terminals are notched, sheared and formed successively and simultaneously from a blank metallic strip. A plastic bobbin is located adjacent to a final forming and inserting station where the terminals are inserted into associated openings of prepositioned bobbins. Facilities are provided for gripping and carrying the successively and simultaneously notched, sheared and formed terminals during the insertion of the terminals into the bobbins and for holding the facilities in a withdrawn position during a period when the bobbins, with the inserted terminals, are withdrawn from the final forming and inserting station.

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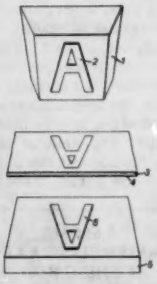
3,651,567

## ELECTRICAL COMPONENTS

John A. Fenner, Ilford, Essex, and William L. Welman, Ilford, both of England, assignors to The Plessey Company Limited, Ilford, England

Filed June 13, 1969, Ser. No. 833,088
Claims priority, application Great Britain, June 14, 1968, 28,573/68
Int. Cl. B41m 3/08; H05k 3/00
U.S. Cl. 29—625 4 Claims



An electrical or electronic component including a substrate carrying an electrically conductive film, the film having been laid down by a dry printing process. This process uses a heated die and a thin plastics foil carrying a metal layer a portion of which layer is embossed onto the substrate to give the required film.

3,651,568

## TRIMMING RAZOR

James L. Barry, Bloomington, and Terrance R. Mitchell, Minneapolis, both of Minn., assignors to Barbers Hairstyling for Men, Inc., Minneapolis, Minn.

Filed Oct. 3, 1969, Ser. No. 863,619
Int. Cl. B26b *21/20*
U.S. Cl. 30—70 8 Claims

A trimming razor has blade support edges of unequal lengths for the corresponding cutting edges of a two-edged blade. One blade edge is preferably less than half the length of the other blade edge, and both blade edges are preferably less than 1 inch long. A razor subassembly is also disclosed in which one of two interengaging body and handle members has an axial recess, with an adjusting knob rotatably supported in the recess. The knob is inserted axially when the body and handle are separated and is retained in the recess when the body and handle are assembled. Rotation of the knob moves a cap member into or out of a blade retaining position.

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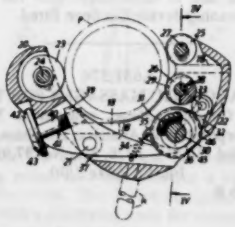
3,651,569

## DEVICE FOR WORKING A CYLINDRICAL WORKPIECE

Alfred Erwin Reginald Arnot, The Bell House, Baughurst, Basingstoke, Hampshire, England

Filed Apr. 18, 1969, Ser. No. 817,313
Claims priority, application Great Britain, Apr. 22, 1968, 1,899/68
Int. Cl. B23d *21/04*; B23b *5/14*
U.S. Cl. 30—95 24 Claims



A pipe cutter or the like, comprising a frame carrying a movable cutting tool; rollers mounted on the frame to engage the pipe, and one of said rollers being driven by rotation of the cutter relative to the pipe; and a drive arrangement operated by the driven roller to feed the cutting tool radially into the pipe material as the cutter revolves relatively around the pipe. The drive which feeds the tool includes a one-way clutch device and a manually-operated adjustor is provided to reset the cutting tool prior to the start of a cutting operation.

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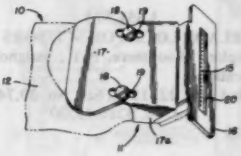
3,651,570

## HAIR CUTTING CLIPPER ATTACHMENT

Ermy W. Groves, Columbus, Ohio, assignor to Donald L. Groves, Columbus, Ohio, a part interest

Filed June 8, 1970, Ser. No. 44,141
Int. Cl. B26b *19/38*
U.S. Cl. 30—233 3 Claims



An adjustable attachment for standard hair cutting clippers which includes a slotted bearing head that bears flat against the hair so that it can be effectively used by an amateur to cut and trim the hair in a proper manner.

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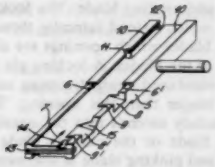
3,651,571

## CARPET CUTTER BLADE HOLDER

Richard Bernard Neale, Langston, Newport, England, assignor to Better Cutting Tools (Newport) Limited, Newport, Great Britain

Filed Dec. 23, 1969, Ser. No. 887,697
Claims priority, application Great Britain, Dec. 24, 1968, 61,439/68
Int. Cl. B26b *29/02*
U.S. Cl. 30—162 7 Claims



The invention relates to cutter blade holders and cutter blades for use in the manufacture of tufted carpets. The conventional strip like blades slide into the holders and are rigidly located therein by raised projections in the surface of the blade located in slots in the holder.

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3,651,572

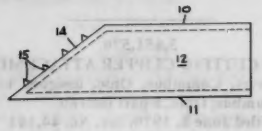
## WINDSHIELD ICE SCRAPER

Steve Marich, 7 Marine Drive, Buffalo, N.Y.

Filed Feb. 8, 1971, Ser. No. 113,497
Int. Cl. B26b *3/00*
U.S. Cl. 30—169 4 Claims

A windshield ice scraper in the form of a relatively flat box open at one end and having an oblique wall at its opposite end. The oblique wall and one of the flat walls of the box structure form a chisel-like scraping edge and the oblique wall has surface projections forming a rasp surface for scrap-

ing tenacious ice from a windshield. The user inserts his fingers in the open end of the box for using either the chisel




edge or the rasp surface, the box being reversed in position in changing from one to the other.

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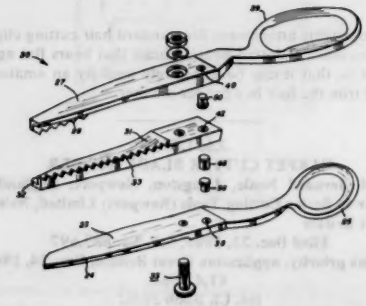
**3,651,573**

**BLADE LOCK FOR SCISSORS**

**Herman L. Kaplan, Woodmere, N.Y., assignor to Cole National Corporation**

**Filed Apr. 22, 1970, Ser. No. 30,748**
**Int. Cl. B26b** *13/00*
**U.S. Cl. 30—226** **14 Claims**



Locking means for a pair of scissors which have a straight cutting blade, a pinking blade and an intermediate combined straight cutting and pinking blade. The locking means comprises openings which extend laterally through each of the aforementioned blades which openings are aligned in a given pivotal position of the blades. A locking pin is located in the opening of the combined straight cutting and pinking blade and is slightly longer than this opening. The locking pin, therefore, alternately extends into the opening in either the straight cutting blade or the pinking blade. The combined straight cutting and pinking blade is alternately locked to the straight cutting blade or the pinking blade depending upon the opening in each of these blades into which the locking pin extends. Means are provided for moving the locking pin between the aforementioned positions. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

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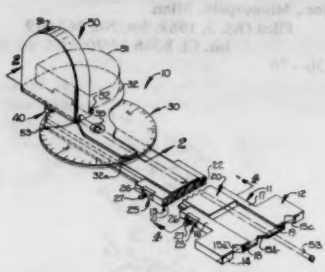
**3,651,574**

**APPARATUS FOR PLOTTING AND MEASURING COURSES ON MAPS**

**Ronald F. Burkart, 3101 Shenandoah, Charlotte, N.C.**

**Filed Aug. 3, 1970, Ser. No. 60,522**
**Int. Cl. A47b** *85/02*
**U.S. Cl. 33—1 SB** **11 Claims**

An apparatus for plotting and measuring courses on maps between points of departure and destination including a base having reference means for alignment with an edge of the map and arm means slidably and adjustably mounted on the base. A compass rose is rotatably and adjustably mounted on the arm for positioning relative to the point of departure and the directional orientation of the map. A retractable rule



means is independently mounted for rotation about the axis of rotation of the compass rose and is retractably extendible radially thereof from the point of departure to the point of destination for indicating the distance and direction between the points of departure and destination.

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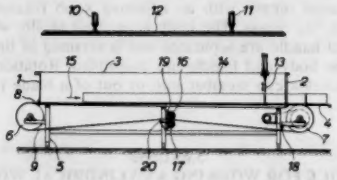
**3,651,575**

**RECTANGULAR, LARGE-SIZED CHEESE MOULD**

**Vaino Kataja, Helsinki, Finland, assignor to MKT-tehtaaty Oy, Helsinki, Finland**

**Filed Apr. 9, 1970, Ser. No. 26,968**
**Claims priority, application Finland, Apr. 11, 1969, 1066/69**
**Int. Cl. A01j** *25/08, 25/15*
**U.S. Cl. 31—44** **4 Claims**



This invention relates to an improvement in a rectangular, large cheese mould, one end of which has been designed as a door through which the bottom of the mould and the cheese mattress resting upon this may be extracted in its own plane from the mould, the bottom of the mould consisting of perforated band or net webbing permeable to whey. The invention is characterized in that the bottom of the mould consists of an endless wire, the upper run of which supports the cheese mattress and in connection with the lower run of which a wire-cleaning device has been fitted.

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**3,651,576**

**ELECTROACOUSTIC MASSAGER FOR THE GUMS**

**Frank Massa, Cohasset, Mass., assignor to Massa Division Dynamics Corporation of America, Hingham, Mass.**

**Filed May 18, 1970, Ser. No. 37,953**
**Int. Cl. A61c** *3/00*
**U.S. Cl. 32—40 R** **20 Claims**

A waterproof dental probe is mounted at one end of a slender handle. The probe includes an ultrasonic transducer

for vibrating the surface of the probe. Thus, ultrasonic vibrations may be transferred to the gums and teeth by applying the vibratile probe to the surface thereof.

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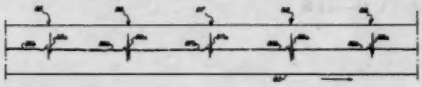
3,651,577

## METHOD AND MEANS FOR VISUAL PRESENTATION OF OCCLUSAL SOUNDS AND FOR ANALYSIS AND COMPARISON THEREOF

Henry Stephen Brenman, Suite 2850 Medical Towers 255 South 17th St., Philadelphia, Pa.

Filed Oct. 10, 1969, Ser. No. 865,304
Int. Cl. A61c 9/00
U.S. Cl. 32—19 17 Claims



Occlusal sounds recorded by a microphone attached to a patient's head are recorded as electrical signals in real time and converted to a visual wave pattern on tape with an expanded time base to permit analysis; individual records can also be collected by a central computer from different locations and converted to a digital basis for comparison of a multitude of separate recordings.

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## ERRATA

For Classes 33—1 and 33—180 see:
Patent Nos. 3,651,574 and 3,651,581

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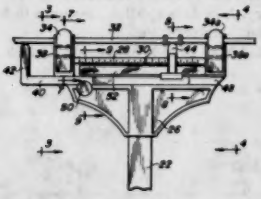
3,651,578

## BOW CHECKING AND CALIBRATING DEVICE

Thomas Allen Saunders, 2223 25th St., and Charles A. Saunders, 313 Morton Road, both of Columbus, Nebr.

Filed Feb. 2, 1970, Ser. No. 7,888
Int. Cl. G01b 3/38
U.S. Cl. 33—180 R 4 Claims



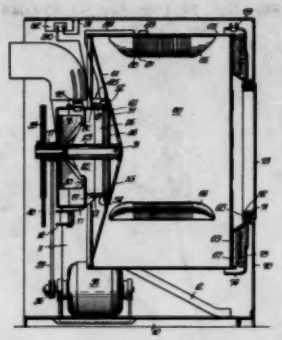
A bow square for checking and recording the bracing height, nocking point, and locations for a kisser and peep sight of an archery bow. The device comprises an elongated plate provided with a graduated scale for measuring the bracing height, and a cross bar extending transversely of the elongated plate and having a scale extending parallel to the bowstring. A pointer mounted on a slidable bar may be moved along the scale on the cross bar to indicate the nocking point and the correct locations of the kisser, and peep sight. Marking receiving means are provided parallel to each scale for recording the correct locations and adjustments.

3,651,579

## DRIER CONTROL

Thomas R. Smith, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Original application Dec. 9, 1963, Ser. No. 329,155, now Patent No. 10191971, Continuation of application Ser. No. 22,323, Apr. 14, 1960, now abandoned. Divided and this application Dec. 27, 1966, Ser. No. 604,757
Int. Cl. F26b 19/00
U.S. Cl. 34—45 28 Claims



This invention is directed to a control for determining the moisture content of articles. Electrodes are positioned to be bridged by samples of articles in a treatment apparatus. In at least one embodiment, a capacitor is connected in circuit with the electrodes so that the charge thereon varies with the moisture content of the material as measured by the resistance of the material between the electrodes. A trigger circuit containing an electrical breakdown device having an effectively infinite resistance in one condition, as, for example, a neon lamp, provides a signal when the material achieves a predetermined moisture content. A switch responds to the signal for operating a control.

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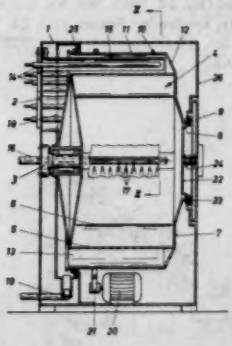
3,651,580

## DRUM DRYER FOR LAUNDRY

Anfried Meyer, Neckargartacherstrasse, 7101 Frankenbach, Germany

Filed Oct. 20, 1969, Ser. No. 867,446
Int. Cl. F26b 11/04
U.S. Cl. 34—133 15 Claims



A drum dryer for laundry, consisting of an inner drum with a perforated inner drum jacket rotatably mounted in a stationary housing, a heating unit for heating the air conducted

into the inner drum and an outer drum surrounding this inner drum, the inner surface of which outer drum is cooled by a liquid in order to condense the steam emanating from the inner drum. The outer drum likewise executes a rotary movement, and the cooling fluid is conducted by means of a feed line directly into the annular space formed between the inner drum and the outer drum.

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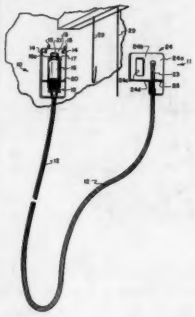
**3,651,581**

**METHOD AND APPARATUS FOR HANGING CEILINGS**

**Ervin Lehman, 558 East 1st N., Logan, Utah**

**Filed Nov. 24, 1969, Ser. No. 879,046**
**Int. Cl. G01c** *5/04*
**U.S. Cl. 33—209** **1 Claim**



A method of easily determining the ceiling suspension height of support wires for a hanging ceiling and apparatus including a reservoir container having a marker line thereon and a wire bending level indicator with a marker line thereon interconnected by a transfer tube, whereby the ceiling elevation can be easily set and then be transferred to any support wire point within the reach of the transfer tube.

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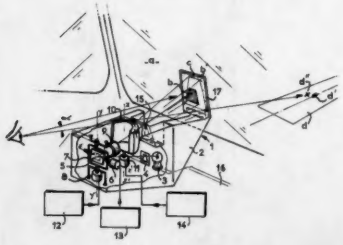
**3,651,582**

**METHOD OF GENERATING A NON-COLLIMATED SYNTHESIZED DISPLAY TO ASSIST IN PILOTING AN AIRCRAFT, AND SYSTEM FOR PERFORMING THE SAME**

**Jean Lavarenne, Villecresnes, France, assignor to Nord-Aviation Societe Nationale de Constructions Aeronautiques, Seine, France**

**Filed Oct. 24, 1969, Ser. No. 868,984**
**Claims priority, application France, Oct. 24, 1968, 171260**
**Int. Cl. G09b** *9/08;* **G06g** *7/78*
**U.S. Cl. 35—10.2** **11 Claims**



A system for providing a non-collimated synthesized display, by way of a pilot's aid, notably during the approach and precision landing phase in poor visibility.

A movable and deformable synthesized picture of the runway, as the pilot would normally see it at any time, is supplied and so correlated with a fixed reference frame on the front window of the cockpit that the overall interpretation of these two data provides the pilot with clear and intuitive indications enabling him to carry out the necessary maneuvers or providing him with confirmation of the proper functioning of an operative automation system.

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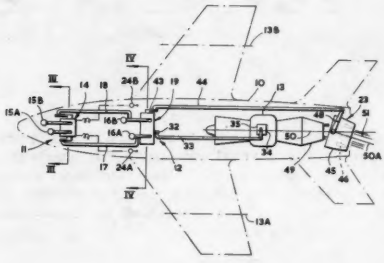
**3,651,583**

**TRAINER AIRCRAFT**

**Kenneth William Clark, Filton, and Reginald Frank Hopton, Fishponds, both of England, assignors to Rolls-Royce Limited, Derby, England**

**Filed Apr. 24, 1970, Ser. No. 31,720**
**Int. Cl. B64g** *7/00;* **G09b** *9/08*
**U.S. Cl. 35—12 B** **3 Claims**



A trainer aircraft having an actual engine and means for simulating one-sided power loss in a pair of imaginary engines situated at opposite sides of the aircraft. Two throttle control levers are connected to feed to the actual engine a signal proportionate to the sum of the lever settings while a signal proportionate to difference of the lever settings in fed to a means for imparting a yawing moment on the aircraft, so that if one of the levers is retracted while the other remains advanced the effect will be as if one of the imaginary engines has suffered a power loss while the other remains at power.

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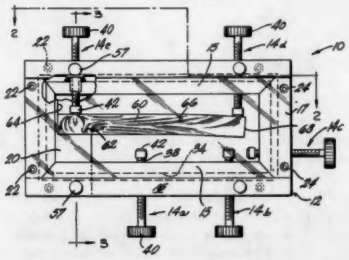
**3,651,584**

**APPARATUS FOR VISUALLY DEMONSTRATING STRESS PATTERNS IN A PHOTOELASTIC MODEL**

**Charles C. Perry, Ann Arbor, Mich., assignor to Vishay Intertechnology, Inc., Malvern, Pa.**

**Filed May 27, 1970, Ser. No. 41,015**
**Int. Cl. G09b** *23/06*
**U.S. Cl. 35—19 R** **7 Claims**



Apparatus consisting of a frame in which a photoelastic model of a structural member is mounted in a floating position and a plurality of separately actuatable load applying members are movably mounted on the frame for applying various loads to the model to visually demonstrate various

stress patterns in the model corresponding to the various loads applied thereto.

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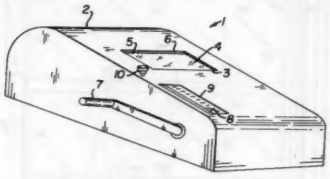
**3,651,585**
**TESTING MACHINE**
**Guido Perrella, Montreal, and Robert Genest, Outremont, Quebec, both of Canada, assignors to Testograph Limited, Lachine, Quebec, Canada**
**Filed Mar. 30, 1970, Ser. No. 23,777**
**Claims priority, application Canada, Apr. 10, 1969, 048,322**
**Int. Cl. G09b** *19/00*
**U.S. Cl. 35—22 R** **4 Claims**



A psychological test taking apparatus having its own source of energy, independent of electrical outlets and the like. A series of questions on a paper roll in the machine sequentially appear in a window large enough for the testee to provide an answer beneath the question. Means is provided for actuation by the testee to open the window and to effect actuation of a timing mechanism. Expiry of a given time period prior to the completion of the answer automatically closes the window and marks the expired time on the paper and there is means responsive to actuation by the testee for closing the window and marking the paper if the answer is completed prior to the expiry of the time.

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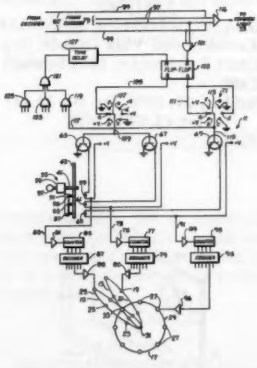
**3,651,586**
**DISPLAY DEVICE**
**James W. Funk, 9019 Reading Ave., Los Angeles, Calif.**
**Filed June 18, 1970, Ser. No. 47,292**
**Int. Cl. G09b** *27/02, 29/00*
**U.S. Cl. 35—45** **9 Claims**



A display device comprising first and second sets of lights arranged in an elliptical pattern and a third set of lights arranged in a generally circular pattern. The elliptical patterns intersect and one light which is common to both of the first and second sets is located at the region of intersection. The common light is also located substantially along the circular pattern. First and second circuits alternately and sequentially illuminate the lights of the first and second sets, respectively, to create the illusion of movement along the elliptical patterns. Eventually both of the circuits will simultaneously illuminate the common light. When this occurs, a third circuit becomes operative to alternately and sequentially illuminate and extinguish the lights in the circular pattern to provide an illusion of movement along the circular path. At the same time, the lights of the two elliptical patterns are extinguished.

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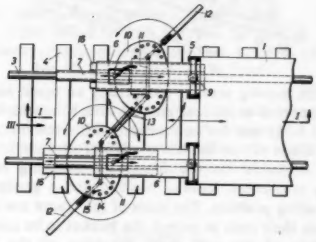
**3,651,587**
**MOBILE BALLAST TREATING MACHINE**
**Franz Plasser, and Josef Theurer, both of Johannesgasse 1010, Vienna, Austria**
**Filed July 17, 1969, Ser. No. 842,564**
**Claims priority, application Austria, July 26, 1968, A 7317/68**
**Int. Cl. E01b** *27/02*
**U.S. Cl. 37—105** **10 Claims**



A mobile ballast treating machine carries a plow unit including two plows respectively associated with one of the track rails. The plow unit extends across the ballast bed and one of the plows is adjustable in relation to the other plow in the direction of elongation of the track.

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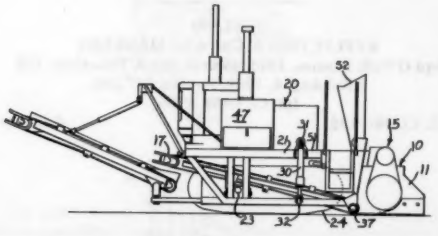
**3,651,588**
**GRADE TRIMMING APPARATUS**
**Raymond A. Hanson, Box 19148 Spokane International Airport, Spokane, Wash.**
**Filed Sept. 18, 1969, Ser. No. 859,146**
**Int. Cl. E02f** *5/00*
**U.S. Cl. 37—108 R** **3 Claims**



A mobile supporting unit for a surfacing apparatus such as a transverse rotary trimmer for excavating and trimming a pavement base to grade along a sidewalk, curb or roadway. The mobile supporting unit comprises a longitudinally open rigid framework carried by transversely spaced track assemblies. The rigid frame is pivotally connected to each track assembly about a common transverse axis and is further mounted for pivotal movement about a longitudinal center axis between the track assemblies. Power suspension means is provided to selectively modify the orientation of the frame

and surfacing apparatus relative to the track assemblies for maintaining a preselected grade and cross leveling attitude during surface operations along a longitudinal path.

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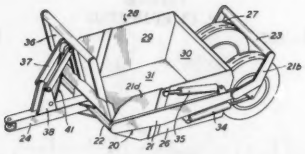
**3,651,589**
**EARTH MOVING SCRAPER AND ACTUATOR SYSTEM THEREFORE**

**Eldon J. Reynolds, Austin, Tex., assignor to Reynolds Research & Manufacturing Corporation**

**Continuation of application Ser. No. 714,830, Mar. 21, 1968, now abandoned. This application Apr. 16, 1970, Ser. No. 29,126**
**Int. Cl. E02f 3/00**
**U.S. Cl. 37—129** **7 Claims**



An earth moving scraper comprising an open, rectangular frame supported at its rear end by wheels and having a tongue at its front end for connection with a tractor. A bucket having a blade across the lower edge of its open front end is pivotally mounted on the frame for swinging between a generally horizontal, loading position and a generally vertical, unloading position. The sides of the frame are hinged intermediate their ends to permit the bucket to be raised above the surface of the soil upon breaking of the hinge. A reciprocating actuator is connected between the bucket and the frame for swinging the bucket between horizontal and vertical positions, and another reciprocating actuator connects the sides of the frame on opposite sides of the hinge for selectively breaking it to raise the bucket and blade above loading position. In one embodiment of the scraper, the opening into the bucket is adapted to be closed by a gate while, in another embodiment, this opening is adapted to be partially closed by an apron. Each of the gate and apron are swung between open and flow restricting positions by means of still another reciprocating actuator connected between it and the frame. Hydraulic systems for operating the actuators include means which prevent these components from moving between their alternative positions in other than a desired sequence.

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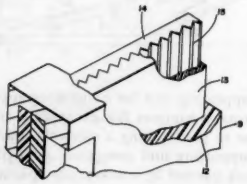
**3,651,590**
**REFLECTION SIGNS AND MARKERS**

**Floyd O'Neill Thomas, 2316 Harcroft Road, Timonium, Md.**

**Filed Aug. 4, 1969, Ser. No. 847,206**
**Int. Cl. G09f 7/00**
**U.S. Cl. 40—135** **4 Claims**



Signs having indicia-shaped apertures in an outer framework exposing through the apertures reflective cores recessed within the framework; textured surfaces on the reflective cores provide multi-directional reflectivity contrasting with the outer framework.

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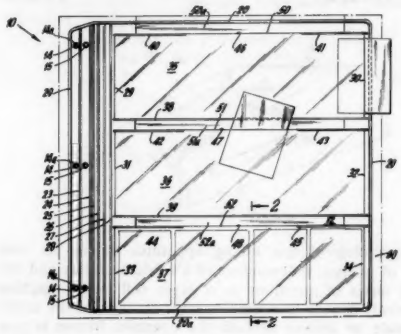
**3,651,591**
**PHOTO ALBUM PAGE**

**John B. Woodyard, New Providence, N.J., assignor to The C. R. Gibson Company, Norwalk, Conn.**

**Filed Oct. 20, 1970, Ser. No. 82,372**
**Int. Cl. B42f**
**U.S. Cl. 40—104.19** **8 Claims**



A photograph album page is made of precut sheets of a transparent flexible film material which are sealed to and over the faces of an opaque flexible backing sheet so as to form thereupon photo-protective sleeves extending between slits formed along opposite margins of the transparent sheets. The sheets are made of thermoplastic resin materials and are heat-sealed together along their edges and along the bottom border and partly along the top border of each sleeve portion. Each sleeve thus has a side opening and open ends for easy insertion and removal of photographs which fit under and are viewed through the sleeve. cutaway portions of the transparent sheets along the sleeve portions expose matte areas of the backing which are receptive to photo-identifying pen or pencil markings.

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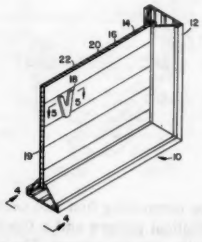
**3,651,592**
**LAMINATED MAGNETIC SIGNBOARD**

**Harold H. McCormick, 405 Vista Grande, Newport Beach, Calif., and Robert F. Schroeder, 1821 Santiago Drive, Newport Beach, Calif.**

**Filed May 21, 1970, Ser. No. 39,417**
**Int. Cl. G09f 7/02**
**U.S. Cl. 40—142 A** **4 Claims**



A signboard comprising a lightweight laminate incorporating a core of strong lightweight material such as polystyrene

between a ferromagnetic sandwich sheet, with a suitable frame and lightweight magnetic symbols presented thereon. The lightweight magnetic symbols are fabricated from a strong lightweight material such as fiberglass or plastic, and are magnetically affixed to selected points on the ferromagnetic surface of the signboard by a magnetic sheet material on each symbol.

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**3,651,593**

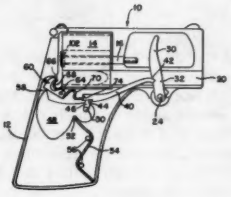
**REVOLVER FIRING MECHANISM WITH THE TRIGGER EXTENDING ABOVE AND STRADDLING THE BARREL**

**Athol Ben Clark, 3804 Westlawn, Amarillo, Tex.**

**Filed Mar. 27, 1970, Ser. No. 23,259**

**Int. Cl. F41c** *1/00*

**U.S. Cl. 42—65** **10 Claims**



A body means has a cartridge cylinder rotatably supported thereby. A barrel is also supported by the body means and is aligned with the lower part of the cylinder. A trigger is pivotally supported by the body means and includes a pair of portions extending on opposite sides of the barrel so that a portion of the trigger straddles the barrel. Revolving means for revolving the cylinder is operatively connected with one of said portions of the trigger at one side of the revolver and is disposed within a handle portion of the body means. A firing means for firing the revolver is operatively connected with the other of said portions of the trigger at the opposite side of the body means and is also disposed within said handle portion.

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**3,651,594**

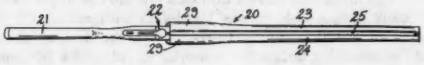
**SHOTGUN BARREL CONSTRUCTION**

**Robert L. Hillberg, 780 West Main St., Cheshire, Conn.**

**Original application Jan. 22, 1968, Ser. No. 699,476, now Patent No. 3,546,417. Divided and this application Oct. 6, 1969, Ser. No. 870,858**

**Int. Cl. F41c** *21/08, 21/06*

**U.S. Cl. 42—76 R** **5 Claims**



A double-barrel assembly for a double-barrel shotgun wherein the barrels are joined at the muzzle ends thereof by a member which spaces and rigidly holds the barrels in fixed relation. A rib of molded nonmetallic is so formed as to be locked to the barrel assembly.

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**3,651,595**

**ELECTRIC SHRIMP TRAWL**

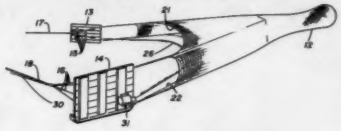
**James Lee Newman, 1321 Glen Cove, Richardson, Tex.**

**Filed Aug. 14, 1970, Ser. No. 63,835**

**Int. Cl. A01k** *73/02*

**U.S. Cl. 43—9** **14 Claims**

A first electrode is attached to the footrope of an otter-type shrimp trawl net and a second electrode is attached to the tickler chain of the net. The two electrodes are periodically energized by a power supply located on the towing boat which charges and discharges a capacitor located on one of



the otter doors of the net. The capacitor periodically discharges through the two electrodes and stimulates shrimp embedded in the surface of the sea bottom lying between the electrodes.

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**3,651,596**

**FUEL ELEMENT, IN PARTICULAR FOR GRILLING AND SMOKING FOOD**

**John Harry Orsing, Avangsgatan 2, Raa, Sweden**

**Filed Feb. 13, 1969, Ser. No. 799,030**

**Claims priority, application Sweden, Nov. 1, 1968, 14830/68**

**Int. Cl. C10l** *11/00;* **A23b** *1/04*

**U.S. Cl. 44—40** **7 Claims**

A fuel element for grilling or smoking comprises a refractory casing enclosing the fuel, which retains the fuel and combustion residues thereof but is sufficiently permeable to allow the air necessary for the combustion of the fuel to pass therethrough.

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**3,651,597**

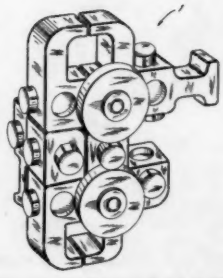
**INTERCONNECTING TOY BLOCK SET**

**Robert Daenen, Erembodegem, Belgium, assignor to Dart Industries, Inc., Los Angeles, Calif.**

**Filed Aug. 8, 1969, Ser. No. 848,445**

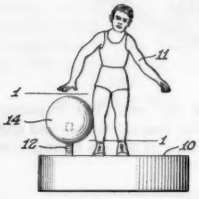
**Int. Cl. A63h** *33/08*

**U.S. Cl. 46—25** **9 Claims**



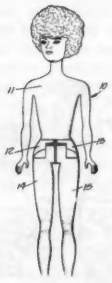
An interconnecting toy building block set that has as its basis a modular concept and in which the basic module is a cube. Each block-like piece of the set has this cubic construction which further includes appropriately positioned male projections and female recesses. These respective projections and recesses provide the means for interconnecting the various blocks. Several of the block-like pieces also include variously shaped protrusions which, although being framed within the confines of cube of similar size to the basic cube, add distinctively to the overall block shapes. It is principally these distinctive shapes which contribute to the many items that may be formed by interconnecting the blocks.

**3,651,598**
**FIGURE AND OSCILLATABLE BALL ASSEMBLY**
**Dean D. Lang, W220, N5459 Town Line Road, Sussex, Wis.**
**Filed Mar. 19, 1970, Ser. No. 21,115**
**Int. Cl. A63h** *13/00*
**U.S. Cl. 46—116** **1 Claim**



A miniature figure of a human being affixed to a base, with one arm outstretched forwardly, the base having a leaf spring fastened by one end to its upper surface adjoining the rear thereof, said spring when at rest being inclined upwardly and forwardly with a simulated basketball fastened to the free end thereof just under the outstretched hand of the figure, whereby when the ball is set in up and down movement it will continue to move for a protracted period as if it were bounding under the hand of the figure.

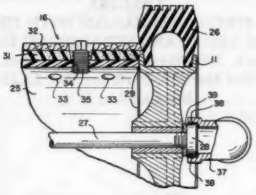
**3,651,599**
**DOLL LIMB CONSTRUCTION**
**Carl Akira Morita, Oahu, Hawaii, assignor to Waimanalo Research Laboratory, Waimanalo, Hawaii**
**Filed May 7, 1970, Ser. No. 35,408**
**Int. Cl. A63h** *3/46*
**U.S. Cl. 46—161** **10 Claims**



Each limb of a doll includes a hip member removably secured to the torso for individual swiveling movement about an axis parallel to the doll body long dimension. A buttock and thigh member is pivotably secured to each hip member for adjustive rotation about a transverse axis. As a result of the segmented construction of the doll limbs and lower trunk, each leg can be adjustably pivoted about two axes to provide the doll with any desired limb pose.

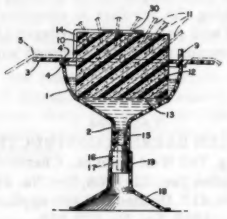
**3,651,600**
**HERBICIDE APPLICATOR**
**Bernard E. Ewing, 1717 S. Arlington Ave., Indianapolis, Ind.**
**Filed May 14, 1970, Ser. No. 37,159**
**Int. Cl. A01c** *23/00*
**U.S. Cl. 47—1.5** **5 Claims**

An applicator for applying a liquid herbicide to lawns comprises a hollow drum having an absorbent, herbicide-permeable covering which is fed with herbicide from a supply thereof contained within the drum. Rigid with the drum at its ends are wheels somewhat larger than the drum to maintain the absorbent covering of the drum spaced above the ground. The drum has a hollow, rigid core provided over a limited segment of its periphery with feed openings through which herbicide within the core can reach the absorbent covering.



The interior of the drum is sealed against communication with the atmosphere except through the feed openings, so that when the device is not in use and the openings are disposed either wholly above or wholly below the liquid level in the ground, escape of herbicide will be prevented. An appropriate means is provided for propelling the applicator over a lawn with the wheels supporting the absorbent drum-surface spaced above the ground.

**3,651,601**
**FLOWER HOLDERS**
**Richard L. La Montagne, 1112 N. Federal Hwy., Boynton Beach, Fla.**
**Filed July 31, 1970, Ser. No. 59,920**
**Int. Cl. A47g** *7/02*
**U.S. Cl. 47—41.12** **3 Claims**

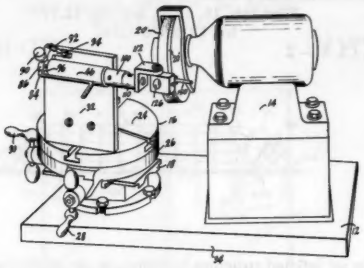


Improvements are set forth in portable flower holders usable for bouquets that are handheld or for stationery decorations. The holder includes a dish or a plurality of interlocked, vertically supportable means for dishes with removable lip means encircling a bouquet arranged in the dish or dishes and for attaching decorative material to enframe a bouquet; spongelike means that is efficiently kept uniformly moist to maintain flowers fresh over a longer period; and a removable funnel-shaped base that is serviceable as a funnel and serviceable in vertically supporting the holder and that is unobtrusively attachable to the holder when the holder is to be held in the hand.

**3,651,602**
**DRILL GRINDING MACHINE**
**Elmer W. Hillier, Swartz Creek, Mich., assignor to Hillier-Thomas Corporation, Swartz Creek, Mich.**
**Filed Oct. 19, 1970, Ser. No. 81,649**
**Int. Cl. B24b** *9/00, 47/02*
**U.S. Cl. 51—96** **8 Claims**

A simplified drill grinding machine capable of enabling unskilled persons to be quickly trained for high-production hand sharpening of drills, end mills, and the like, in which the

indexing of the drill and the rate and degree of grinding thereof is manually provided and controlled while, at the same time, mechanical positioning and "feel" is provided for carrying out the grinding operation.



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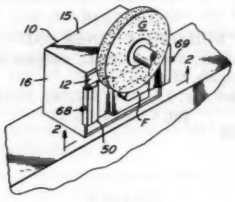
**3,651,603**
**WORK HOLDER**
**Richard D. Patch, Drexel Hill, Pa., assignor to Castle Tool Specialty Co. Inc., Lansdowne, Pa.**
**Filed Oct. 5, 1970, Ser. No. 78,060**
**Int. Cl. B24b *41/06***
**U.S. Cl. 51—216 R** **9 Claims**



A work holder or positioner for forms is provided which retains forms for continuous grinding of round or square end forms without the use of cams or templates, the forms being held in a turntable which indexes and also travels horizontally for engagement by a grinding wheel with the form to be ground.

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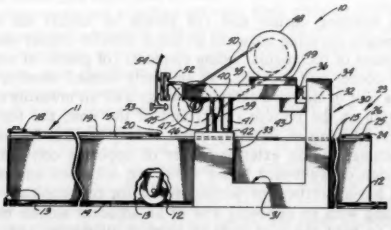
**3,651,604**
**PROCESS FOR IMPROVING SURFACE FINISH ON CLAD ALUMINUM SHEETS**
**Paul J. Queyrel, Newport Beach, and Jerome O. Koenig, Culver City, both of Calif., assignors to Mill Polishing Corporation, Huntington Park, Calif.**
**Filed Nov. 25, 1970, Ser. No. 92,562**
**Int. Cl. B24b *1/00***
**U.S. Cl. 51—317** **6 Claims**



A buffing process for improving the surface finish of clad aluminum-alloy sheets. Aluminum sheet stock is burnished according to a specific process program to provide uniform surface appearance and improved corrosion resistance, and the process provides controlled removal of a thin surface layer of cladding used in aircraft-skin aluminum sheets.

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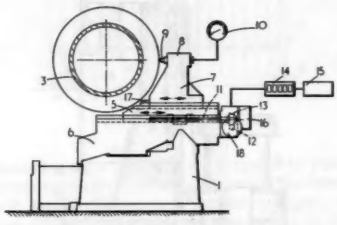
**3,651,605**
**GRINDING MACHINES**
**John Noel Tittle, Knutsford, England, assignor to The Churchill Machine Tool Company Limited, Broadheath, Altrincham, Cheshire, England**
**Filed Feb. 10, 1970, Ser. No. 10,136**
**Claims priority, application Great Britain, Feb. 11, 1969, 7,276/69**
**Int. Cl. B24b *5/04***
**U.S. Cl. 51—49** **2 Claims**



An apparatus in which the diameters of two rolls are matched by grinding one roll, measuring the position of the surface of the ground roll relative to a datum position using a probe, and grinding the second roll until the surface thereof is in the same position relative to the datum position as was the surface of the first roll.

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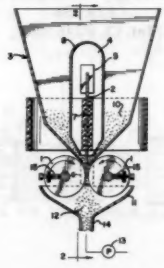
**3,651,606**
**MARGIN PREPARATION MACHINE**
**Walter Sawert, La Grange, Ill., assignor to Continental Can Company, Inc., New York, N.Y.**
**Original application Feb. 26, 1968, Ser. No. 708,334, now Patent No. 3,540,168, dated Nov. 17, 1970. Divided and this application Apr. 17, 1970, Ser. No. 29,594**
**Int. Cl. B24b *7/00, 9/00***
**U.S. Cl. 51—80 R** **8 Claims**



This apparatus is a particle abrasion machine for can body blank margin preparation. Can body margins are abraded to fresh bare metal surface in preparation for welding by passing the can blank edges between elastomeric rolls which rotate as they pass both sides of the blank sheet. At the same time free flowing abrasive grit is fed into the space between the rotating roll and the sheet material and is thus carried by the rolls to the sheet margin. The grit acts as many cutting edges which cut dirt and other matter from the surface on

each side of the sheet. The grit and waste material fall together from the rolls into a collector through which a current of air passes. Suitable means return the grit to the hopper. The separation of grit from waste material is accomplished by a magnet, air blast, or other means.

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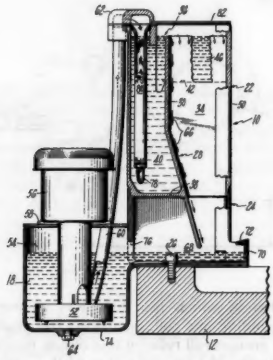
**3,651,607**
**WASTE COLLECTOR**
**Leighton Lee, II, Guilford, Conn., assignor to The Lee Company, Westbrook, Conn.**
**Filed Oct. 29, 1969, Ser. No. 872,141**
**Int. Cl. B24b** *55/06*
**U.S. Cl. 51—270** **2 Claims**



Self-contained waste collector usable in a manufacturing operation and having a spillway of U-shaped configuration in confronting downstream relation to a path of moving debris and directing a gravity waterfall of collection liquid to effect a continuously wetted exposed surface of increased collection area coextensive with the spillway for entrapping debris for disposal.

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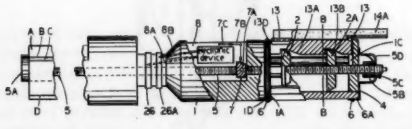
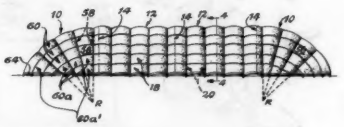
**3,651,608**
**HONING MANDREL**
**Thomas M. Morgan, 2404 E. River Road, Tucson, Ariz.**
**Continuation of application Ser. No. 631,115, Apr., 1967, now abandoned. This application June 2, 1969, Ser. No. 829,238**
**Int. Cl. B24b** *9/02*
**U.S. Cl. 51—338** **3 Claims**



This invention relates to simple type of honing tool for accurately finishing the interior surface of a cylindrical hole in a work piece. It has contained within its body portion and electronic device with means to measure and control the degree of a predetermined amount of finish to the workpiece and to shut off the power when the desired degree of finish is obtained. Another feature of this improved honing tool is that its construction is such that it may be used to finish the interior surface of blind holes in a workpiece.

**3,651,609**
**AIR INFLATED STRUCTURE**
**Walter W. Bird, Williamsville, N.Y., assignor to Birdair Structures, Inc., Buffalo, N.Y.**
**Filed Feb. 18, 1970, Ser. No. 12,177**
**Int. Cl. E04b** *1/345*
**U.S. Cl. 52—2** **12 Claims**



An air inflated structure including an air inflated envelope formed by a plurality of relatively narrow, horizontally elongated panels having horizontally extending adjacent edge portions joined together, and a cable system having a series of widely spaced parallel flexible tension devices anchored to their opposite ends to the ground or other suitable structure base. The tension devices extend transversely of and are fixed relative to the envelope panels. The arrangement reduces the maximum fabric stresses in the envelope material, and permits substantially all loads to be transferred from the envelope panels horizontally into the tension devices and be carried thereby to the ground, thereby limiting propagation of rips or tears occurring in the envelope panels.

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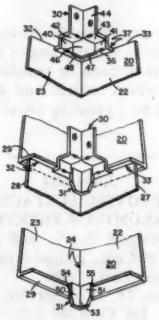
**3,651,610**
**BUILDING CORNER UNIT**
**Patrick H. Donahue, Milton, Mass., assignor to Bird & Son, Inc., East Walpole, Mass.**
**Filed Apr. 23, 1970, Ser. No. 31,155**
**Int. Cl. E04f** *19/02*
**U.S. Cl. 52—278** **5 Claims**

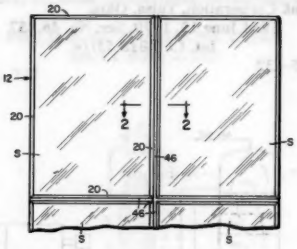


A building corner unit (of plastic or metal) for overlappingly covering adjacent terminal exterior-corner ends of a course of rectangular siding elements (of plastic or metal), said corner unit providing an angularly formed member having a pair of sidewise extending wings with an inwardly offset portion at the bottom (butt) end of the unit, the top end thereof having an inwardly offset nailing bracket for nailing attachment to an exterior corner of opposing conventional wooden or wallboard house sheathing, with one end of the unit having vertical projecting means for telescopically connecting with an opposing end of an adjacent similar corner unit to hold the said units in vertical alignment with each other.

## 3,651,611
## STRUCTURAL GRID FOR SLAB FACING MATERIALS

George J. Santry, New Canaan, Conn., assignor to Corning Glass Works, Corning, N.Y.

Filed May 11, 1970, Ser. No. 36,198
Int. Cl. E04b 1/16
U.S. Cl. 52—379 15 Claims

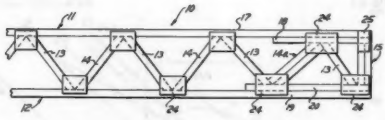


A mounting system structural grid for slab facing materials including a basic building structure and a plurality of adjacent slabs, each slab having attachment means in the vicinity of at least one pair of opposite outside edges. This grid includes a plurality of spaced, parallel first support members, each having at least one leg portion with at least one pair of slots, and a plurality of spaced, parallel second support members, normal to and intersecting but planar with the first support members, and also having at least one leg portion with at least one pair of slots. The slab attachment means are operatively engageable in one of the slots of each of the leg portions of a pair of one of the first and second support members, thereby cooperatively mounting a slab of facing material therebetween. The support members are preferably angularly shaped to form mounting flanges or legs from an L-shape T-shape or U-shape.

## 3,651,612
## FLOOR JOIST

Jack N. Schmitt, Birmingham, Mich., assignor to Truswal Systems, Inc., Troy, Mich.

Filed Nov. 18, 1970, Ser. No. 90,579
Int. Cl. E04c 3/12
U.S. Cl. 52—693 2 Claims

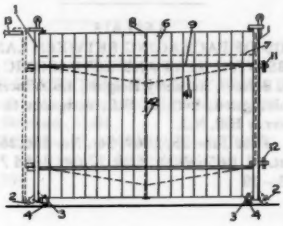


A truss-type floor joist formed of vertically aligned parallel chords connected together between their ends by alternating diagonal web members and at their ends by a pair of vertical end members arranged in face-to-face contact, with the chords, web members and end members all formed of 2×4 wood strips arranged with their narrow edges vertical. Each chord has an inner liner member in the form of a 2×4 wood strip member arranged in face-to-face contact therewith and extending from each end of the chord to a point just past its first, adjacent set of diagonal web members. Each of the joints formed by abutting web members and end members with the chords are overlapped on both vertical faces with metal connector plates having struck-out teeth embedded in the respective overlapped wood members.

## 3,651,613
## METHODS AND MEANS FOR THE TRANSPORTATION OF GOODS

Eeme Sikkema, Auckland, New Zealand, assignor to New Zealand Inventions Development Authority, Wellington, New Zealand

Filed Oct. 10, 1969, Ser. No. 865,421
Claims priority, application New Zealand, Oct. 15, 1968, 154127
Int. Cl. B65b 13/20
U.S. Cl. 53—24 5 Claims

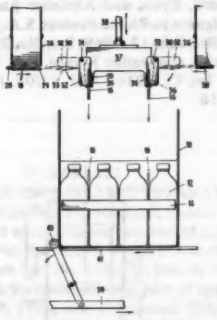


Transportation units for goods are prepared by placing the goods between pressure distributing means in the form of end plates with lateral displacement resistance means, concentrated load or shear distributing resisting means, or shear resisting means positioned at suitable intervals along the length of the unit, and the unit is then made to act as a prestressed beam or prestressed structural unit by applying pressure to the pressure distributing means by the use of tendons maintained under tension in use.

## 3,651,614
## PACKAGING OF BOTTLES, JARS AND OTHER ARTICLES

Henry Morgan Corderoy, Gladesville, New South Wales, Australia, assignor to A.C.I. Operations Pty. Limited, Melbourne, Victoria, Australia

Filed Oct. 30, 1969, Ser. No. 872,531
Claims priority, application Australia, Oct. 31, 1968, Jan. 13, 1969; 45656/68, 48994/69
Int. Cl. B65b 35/00, 61/00
U.S. Cl. 53—26 16 Claims



The present invention relates to an improved method and apparatus for packing bottles or the like in cartons. It provides a speedy and economical manner of packing and results in such saving of material compared to the hitherto used methods. Bottles or the like are arranged in columns and rows in open containers and partition strips are inserted

therebetween. The strips are discharged from a magazine and are gathered by a finger which transfers the strip to a position horizontally above the container and disposed vertically above the space between adjacent rows of bottles. A plunger drops and collects the strip from the finger and presses it into the said space between adjacent rows of bottles. The container is then moved to a subsequent station for similar operation but wherein the partition strip is inserted at right angles to said firstmentioned strip. The action of inserting the secondmentioned strip forces said firstmentioned strip downwardly between the bottles.

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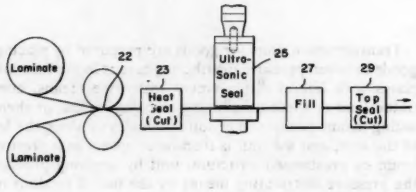
**3,651,615**

**METHOD OF PACKAGING BETWEEN LAMINATED WEBS WITH HEAT AND ULTRASONIC SEALS**

**Thomas H. Bohner, Berkeley Heights, and Vincent L. Vaillancourt, Livingston, both of N.J., assignors to C. L. Band, Inc., Murray Hill, N.J.**

**Filed June 25, 1969, Ser. No. 836,261**
**Int. Cl. B65b** *9/02*; **B29c** *27/08*; **B65d** *77/08*
**U.S. Cl. 53—28** **3 Claims**




A sealed package of metal-foil-polyethylene laminates, at least one edge of which is sealed by ultrasonic means, to form a rupturable seal through which the contents of the package can be released by moderate pressure on the package walls; and the method of making and filling such a package singly or in groups and with or without integrally attached package portions for receiving articles to which the contents of the rupturable package may eventually be supplied.

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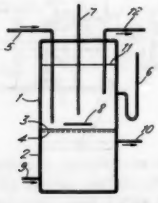
**3,651,616**

**PROCESS FOR EFFECTING ABSORPTION OR REMOVAL OF GAS FROM A LIQUID**

**Alain Blanchard, Lyon, and Alphonse Faure, Bron, both of France, assignors to Rhone-Poulenc S.A., Paris, France**

**Filed Feb. 13, 1969, Ser. No. 799,059**
**Claims priority, application France, Feb. 14, 1968, 139879**
**Int. Cl. B01d** *53/22, 31/00, 12/00*
**U.S. Cl. 55—16** **10 Claims**



Gases, e.g., oxygen, are advantageously absorbed by or removed from aqueous liquids, especially blood, by passage along a partial pressure gradient through a waterproof, porous membrane having pores with an apparent diameter of 0.01 to 3$\mu$ and a critical surface tension of less than 40 dynes/cm. at 20° C.

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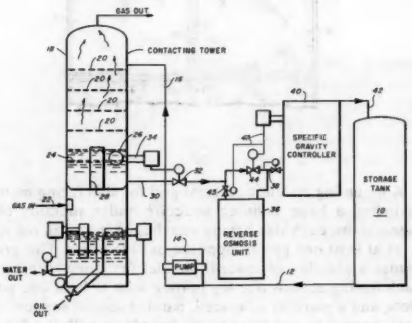
**3,651,617**

**RECONCENTRATING HYDROSCOPIC LIQUIDS USED IN GAS DEHYDRATION WITH REVERSE OSMOSIS**

**Robert A. Hodgson, Tulsa, Okla., assignor to Maloney-Crawford Tank Corporation, Tulsa, Okla.**

**Filed June 15, 1970, Ser. No. 46,257**
**Int. Cl. B01d** *53/14*
**U.S. Cl. 55—32** **7 Claims**




Hygroscopic liquid used to dehydrate wet gas streams is regenerated by causing the liquid to flow through a reverse osmosis system after which the liquid is stored and/or reused for dehydration.

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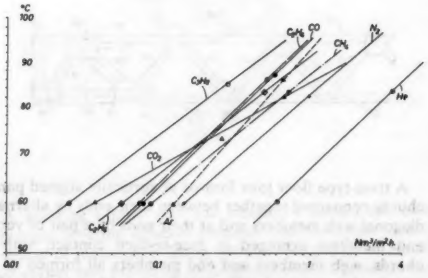
**3,651,618**

**SEPARATION OF FLUIDS BY DIFFUSION THROUGH SEMIPERMEABLE MEMBRANES**

**Gunter Klein, Neuried, and Johann Neumann, Oberhausen, both of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden and Kempchen & Co. GmbH, Oberhausen, Germany**

**Filed May 20, 1970, Ser. No. 39,124**
**Claims priority, application Germany, May 20, 1969, P 19 25 582.4**
**Int. Cl. B01d** *59/12*
**U.S. Cl. 55—16** **20 Claims**




In a process comprising diffusing a fluid through the upstream side of a semipermeable membrane having upstream and downstream sides, to the downstream side, the improvement comprising exposing the downstream side during said diffusing to either a liquid which does not wet the downstream side, or to the vapor of said liquid, whereby the rate of diffusion of said fluid through said membrane is in-

creased and wherein said semipermeable membrane is a microporous sintered material, e.g., polytetrafluoroethylene having a pore diameter of 1–1,000, preferably 5–200 microns.

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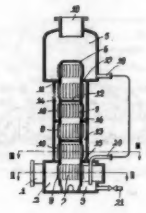
**3,651,619**

## APPARATUS FOR PURIFICATION OF GAS

**Mitsugi Miura, 2-Chome Tezukayama, Sumuyoshi-ku, Osaka, Japan**

**Filed Mar. 30, 1970, Ser. No. 23,563**
**Int. Cl. B01d** *47/10*
**U.S. Cl. 55—237** **6 Claims**



A perforated cylinder having a plurality of unit perforated cylinders arranged in series and having a pair of upper and lower slits formed in the tangential direction in the sidewall. The upper portion of the cylinder is sealed and the lower portion is opened. A gas charging chamber having a gas feed pipe and a liquid feed pipe is provided at the outside bottom of the first unit cylinder. A gas-liquid separation chamber having a cleaned gas discharge pipe and a separated liquid discharge pipe is located towards the top of the last unit cylinder. Gas-liquid separation chambers having separated liquid discharge pipes are provided at the top of the cylinder in the center and at the outside of the next stage cylinder and gas passages are provided at the outside of the perforated cylinders located between said two chambers and a liquid feed pipe is connected to the bottom of the unit perforated cylinder in the middle.

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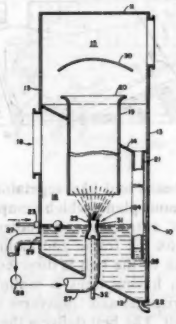
**3,651,620**

## GAS SCRUBBER

**Roland L. Lincoln, Macungie, Pa., assignor to Fuller Company, Catasaugua, Pa.**

**Filed Apr. 22, 1970, Ser. No. 30,670**
**Int. Cl. B01d** *47/00*
**U.S. Cl. 55—228** **12 Claims**



The instant invention relates to a gas scrubber for cleaning dirty gas comprising an enclosed vessel having bottom, top and side walls, means dividing said vessel into upper and lower compartments, the bottom portion of said lower compartment defining a settling basin, at least one substantially vertically disposed open-ended gas collecting tube extending through said dividing means into both said compartments, an atomizing nozzle in said lower compartment positioned below each said gas collecting tube so as to discharge a mixture of a scrubbing liquid and a compressed gas upwardly into each said gas collecting tube, and means for circulating scrubbing liquid from said settling basin to said atomizing nozzle.

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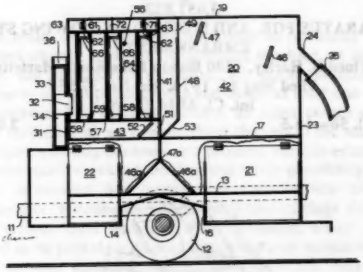
**3,651,621**

## MACHINE FOR EXTRACTING DIRT FROM HOLES

**Henry J. Davis, c/o Automation International Inc. 350 N. Edison St., Stockton, Calif.**

**Filed Nov. 17, 1969, Ser. No. 877,292**
**Int. Cl. B01d** *46/04*
**U.S. Cl. 55—304** **2 Claims**



A portable machine used to raise dirt, rocks, and the like from holes, such as fence post and utility pole holes and similar purposes. Means is provided in a closed chamber to extract the heavy and the light dirt particles by gravity separation and then to extract the fine particles by cloth bag filtration. Means is provided to clean the fiber cloths by mechanical vibration. A blower draws a vacuum through the chamber and then through a hose which is lowered into the hole being cleaned.

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**3,651,622**

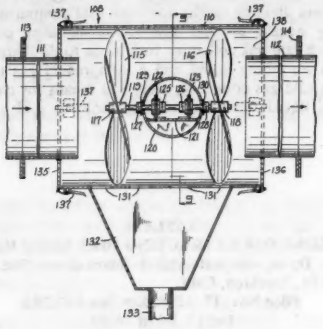
## MOISTURE ELIMINATING APPARATUS

**Walter L. Wisting, Fairfield Pl., Madison, Conn.**

**Continuation-in-part of application Ser. No. 461,587, May 17, 1965, now Patent No. 3,406,492, which is a continuation-in-part of application Ser. No. 418,379, Dec. 4, 1964, now abandoned , which is a continuation-in-part of application Ser. No. 381,178, July 8, 1964, now abandoned. This application Feb. 15, 1968, Ser. No. 705,707**
**Int. Cl. B01d** *45/08*
**U.S. Cl. 55—404** **5 Claims**

This disclosure relates to an apparatus for removing liquid from a gas stream. A fan is positioned within a casing before an outlet opening therein and arranged to be driven at very high speeds by the gas flow through the casing. Moisture particles in the gas stream strike the blades of the fan as it

rotates and are centrifugally thrown directly to the walls of the casing. The blades of the fan are constructed with substantially planar surfaces which define direct paths for flow of gas therethrough.



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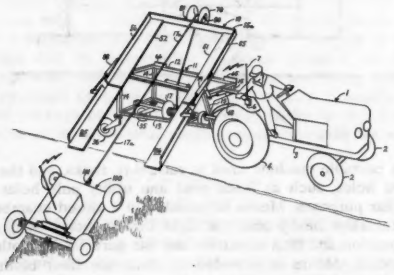
**3,651,623**
**APPARATUS FOR, AND METHOD OF MOWING STEEP EMBANKMENTS**
**Rutherford B. Harley, 4300 Bishop Lake Road, Marietta, Ga.**
**Filed May 15, 1970, Ser. No. 37,537**
**Int. Cl. A01d** *35/28*
**U.S. Cl. 56—15.5** **2 Claims**



Apparatus for and a method of mowing vegetation on steep embankments including a tractor-drawn trailer, suitably equipped for (1) transporting a power mower, (2) offloading the mower, and (3) controlling by cable means the substantially vertical ascent and descent of the mower while in operation. The trailer derives its power to control the vertical movement of the mower from a tractor. The power mower contains a radio-controlled steering mechanism for providing lateral movement during the substantially vertical cable-controlled mowing operation, which is responsive to electrical signals from a multiple-channel transmitter, normally mounted on the tractor, but capable of being detached and operated away from the tractor. The combined power mowing apparatus, comprising a tractor, the powered transporting and control trailer, and a radio-controlled power mower, are utilized in a simplified method of mowing vegetation on steep embankments, where conventional power operated mowing equipments are unable to traverse steep grades. The combined apparatus is capable of being operated on service plateaus either above or below embankments, and is usually controlled by a single tractor driving operator; however, in cases where embankments are out of sight of the tractor operator, the transmitter for controlling the lateral displacement of the power mower may be demounted from the tractor and employed by a second operator who is within view of the tractor operator.

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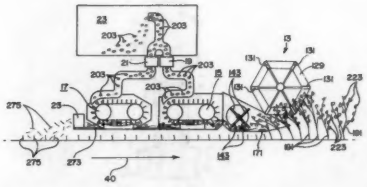
**3,651,624**
**COTTON HARVESTER**
**Martin E. Bandemer, Pine Bluff, Ark., assignor to Ben Pearson Manufacturing Company, Pine Bluff, Ark.**
**Filed May 12, 1970, Ser. No. 36,556**
**Int. Cl. A01d** *45/18*
**U.S. Cl. 56—28** **18 Claims**



A self-propelled machine used to harvest seed cotton. The machine includes a forward assembly comprising a modified crop pickup header having a reciprocating sickle knife, a rotating bat reel and an auger conveyor, a pair of modified conventional cotton picking head assemblies arranged in a tandem relationship, each having been turned 90° about their respective horizontal axis so as to assume a horizontal position as opposed to the usual vertical position, a conventional shreader, a pair of typical delivery fans, the usual receptacle basket, and a conventional prime mover.

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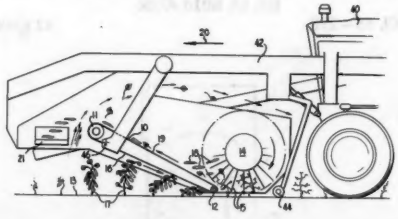
**3,651,625**
**HARVESTER**
**George Redford, 94 Church St. West, and Alan Redford, 102 Ringley Road, Outwood, both of Radcliffe, Lancashire, England**
**Filed May 11, 1970, Ser. No. 36,092**
**Claims priority, application Great Britain, May 10, 1969, 23,914/69**
**Int. Cl. A01d** *45/22*
**U.S. Cl. 56—128** **8 Claims**



A harvester for beans and like vegetables which grow on the stems of leguminous plants which comprises a frame fixable to the front of a tractor. An endless moving belt is pivotably mounted on the frame and inclined to the ground so that the lower run of the belt is directed downwardly and rearwardly. A drum having tines is mounted rearwardly of the belt about a horizontal axis transverse to the direction of movement of the belt. The belt deflects the plants rearwardly towards the drum which on rotation strips the beans from the plants and transfers them to the upper run of the belt for subsequent collection.

3,651,626

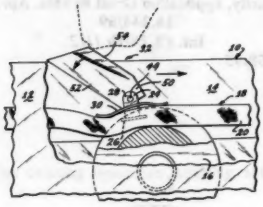
## POWER TRANSMISSION BELTS

Norman Carl Locati, Lake Oswego, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Continuation-in-part of application Ser. No. 759,831, Sept. 16, 1968, now Patent No. 3,545,188, and a continuation-in-part of 033,449, Apr. 30, 1970. This application Nov. 20, 1970, Ser. No. 91,289

Int. Cl. A01d *55/24*

U.S. Cl. 56—290 10 Claims



A flexible reinforced power transmission belt having rigid connectors molded into the cutter belt at spaced intervals. A cutter element is pivotally connected to the protruding end of each connector. A compressed resilient pad between the belt and cutter element urges the cutter element in an extended position but is deformed in response to abnormal impact to permit pivoting of the cutter elements.

3,651,627

## DOUBLE-COMBED MECHANISM WITH ALTERNATE PNEUMATIC OPERATION FOR THE SHAKING OF THE BRANCHES OF THE OLIVE TREES AND THE GATHERING OF ITS FRUITS

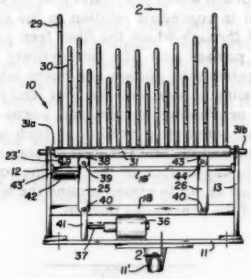
Corrado Pitti, 36 Sciaia El Mazuni, Tripoli, Libia, Italy

Filed Sept. 22, 1970, Ser. No. 74,410

Claims priority, application Italy, Oct. 11, 1969, 40712 A/69

Int. Cl. A01g *19/00*

U.S. Cl. 56—328 R 2 Claims



A device for shaking the branches of a fruit-bearing tree and the like having a series of combs, each including a plurality of teeth, the teeth of each series of combs being spaced from the other with an operator for moving arms connected with the series of combs through longitudinally movable carriers for alternately moving each of the series of combs longitudinally in opposite directions to correspondingly articulate the respective teeth to shake the branches free of their fruit.

3,651,628

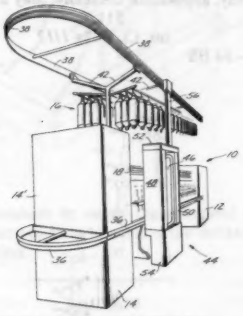
## SUPPORTING MEANS FOR AUTOMATIC YARN PIECING APPARATUS

Albert D. Harmon; Gordon C. Anderson, and George S. Van Deusen, all of Clemson, S.C., assignors to Maremont Corporation, Chicago, Ill.

Filed Sept. 10, 1970, Ser. No. 70,963

Int. Cl. D01h *9/00, 9/10, 15/00*

U.S. Cl. 57—1 R 16 Claims



The main carriage of the apparatus is resiliently track-mounted closely adjacent the spinning machine, at approximately the spindle-rail elevation, for stable bi-directional movement along opposite sides and about at least one end of the machine. The carriage includes an open center section which facilitates its movement about the end of the machine, and which partially encloses and protects various extendable and retractable servicing mechanisms while permitting unimpeded movement and convenient maintenance of such mechanisms. Housing-like sections of the carriage fully enclose various drive and control components, which are so located as to provide a desired distribution of weight relative to the carriage supporting track. A mast section extends upwardly to an overhead rail which supplies electric power to the carriage and laterally stabilizes it.

3,651,629

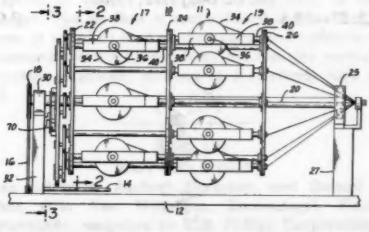
## CABLE FORMING MACHINE

George R. Webster, 5014 Moss Hollow, Houston, Tex.

Filed Apr. 1, 1970, Ser. No. 24,530

Int. Cl. B65h *81/08*; H01b *13/00*

U.S. Cl. 57—13 7 Claims



A multi-conductor cable-forming machine is provided which includes a revolvable frame mounted on a rotatable center shaft having a longitudinal axis of symmetry for the revolvable frame. The frame includes two spaced-apart discs mounted on the center shaft. A plurality of longitudinally extending shafts parallel to each other and to the center shaft are rotatably supported by the discs. The free ends of the shafts are arranged about the periphery of a circle which is concentric with the center of the center shaft. A wire dispensing spool is rotatably mounted on each longitudinal

shaft. Rotatable eccentric means are coupled to the free ends of the shafts to maintain the spools' orientation constant relative to the horizontal.

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**3,651,630**

**APPARATUS FOR PRODUCTION OF MOULINE YARNS**

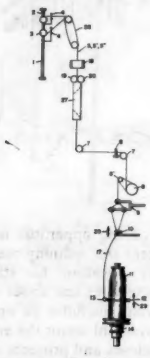
**Hermann Gemeinhardt, Eisenfeld, Germany, assignor to Glanzstoff AG, Wuppertal, Germany**

**Filed May 23, 1969, Ser. No. 827,241**

**Claims priority, application Germany, May 29, 1968, P 17 60 511.7**

**Int. Cl. D02g *1/12***

**U.S. Cl. 57—34 HS** **10 Claims**



Process and apparatus for the production of repeatedly compressed mouline carpet yarns in which the yarn is guided through a compression crimping chamber and then corded with guiding each of the yarns under identical conditions through large angle which is the same for each of the yarns.

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**3,651,631**

**ARRANGEMENT FOR TRAVERSING A YARN IN TWO DIRECTIONS**

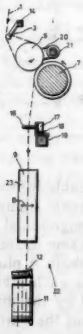
**Rolf F. Regelmann, Buchenbronn, and Wolfgang Riek, Eislingen, Fils, both of Germany, assignors to Zinser-Textilmaschinen Gesellschaft mit Beschrankter Haftung, Ebersbach, Germany**

**Filed Sept. 11, 1970, Ser. No. 71,293**

**Claims priority, application Germany, Sept. 19, 1969, P 19 47 452.3**

**Int. Cl. D02j *1/22, 13/06***

**U.S. Cl. 57—55.5** **7 Claims**



In a textile machine, two traverse (crosswise) movements of the yarn in mutually perpendicular planes are obtained by means of a single oscillating yarn guide and a deflector pin guiding the yarn from one plane to the other and forming an angle with both of the traverse directions.

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**3,651,632**

**OPEN-END SPINNING DEVICES**

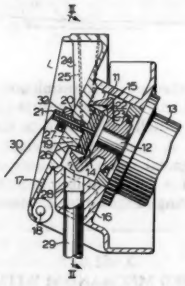
**John M. Shepherd, Ramsbottom, England, assignor to T.M.M. (Research) Limited, Oldham, Lancashire, England**

**Filed Apr. 9, 1970, Ser. No. 26,876**

**Claims priority, application Great Britain, Apr. 9, 1969, 18,244/69**

**Int. Cl. D01h *1/12***

**U.S. Cl. 57—58.95** **20 Claims**



An open end spinning device comprising a spinning rotor having a spinning chamber provided with an internal fiber collecting surface to which fibers in discrete form are fed through a fiber feed passage and from which they are removed to form a twisted yarn which is continuously withdrawn from the spinning chamber through a yarn delivery passage. The rotor has at one end thereof closure means formed with a cylindrical or generally cylindrical penetrating portion which penetrates into the chamber of the spinning rotor in concentric relation to the spinning axis of the rotor and through which the fiber feed passage and the yarn delivery passage pass. The yarn delivery passage passes through the penetrating portion and opens into the end face of the penetrating portion, and the fiber feed passages passes through the penetrating portion and opens into a recess formed in the penetrating portion at such a position that fibers from the end of the fiber feed passage are directed to the fiber collecting surface of the spinning rotor, the recess being so formed as not to extend around the whole of the circumference of the penetrating portion.

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**3,651,633**

**FLANGE FALSE TWIST TEXTURED NYLON**

**William George Steinmiller, Charlotte, N.C., assignor to Fiber Industries, Inc.**

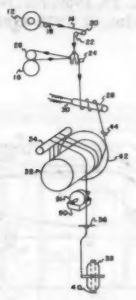
**Filed Oct. 27, 1970, Ser. No. 84,387**

**Int. Cl. D02g *1/02, 3/36***

**U.S. Cl. 57—140 C** **14 Claims**

A novel monofilament nylon yarn suitable for use in knit constructions, particularly women's hosiery, characterized by boardability, twist liveliness and knitability values is disclosed. A combination false twist, topcoating finish applica-

tion process is disclosed as exemplary of methods to produce the yarn. This process may be a simultaneous or sequential



drawing, false twisting operation utilizing a twist insertion flange.

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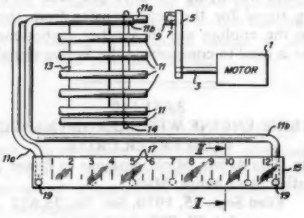
**3,651,634**
**SYSTEMS FOR DISPLAYING VARIOUS PHENOMENA, SUCH AS TIME**

Sidney Cooper, 49 Knollwood Drive, Cherry Hill, N.J.

Filed Jan. 7, 1970, Ser. No. 1,208
Int. Cl. G04b *19/34*
U.S. Cl. 58—50 11 Claims




Many instruments have been employed for indicating different phenomena by mechanical means, as in a clock wherein time is conventionally designated by the movement of hands over time representing digits arranged circumferentially in an endless, circular array, or by means of a rotary drum bearing similar indicia in endless formation. Instruments of this sort are sometimes difficult to read, especially in the dark. The present invention involves a system for transforming the intelligence thus displayed into one wherein a moving spot of light is made to move linearly along a finite scale having a discrete beginning and a discrete end, thereby facilitating the recognition of the involved phenomena at a glance.

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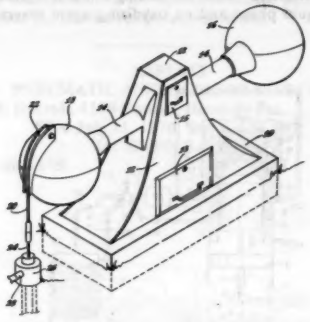
**3,651,635**
**PUMPING JACK**

Robert A. Clay, Costa Mesa, Calif., assignor to Kinetic Power, Inc., Costa Mesa, Calif.

Filed June 29, 1970, Ser. No. 50,388
Int. Cl. F03g *3/00*
U.S. Cl. 60—9 5 Claims

An improved pumping jack is provided for particular use in oil fields for driving oil well pumps, but which has general utility. The pumping jack of the invention includes a member mounted for angular movement about a particular axis, and which defines first and second fluid chambers on either side of the said axis. A pump and valve combination selectively introduces and discharges fluid to and from the first and



second fluid chambers to cause the aforesaid member to oscillate about the axis so as to achieve the desired reciprocal pump driving action.

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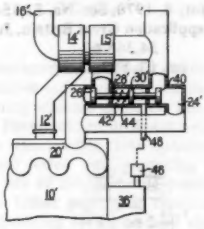
**3,651,636**
**TURBOCHARGER CONTROL**

Stephen F. Glassey, East Peoria, and George E. Olson, Lacon, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 2, 1969, Ser. No. 863,123
Int. Cl. F02b *33/44*, *37/08*
U.S. Cl. 60—13 4 Claims



A control for the turbocharger of an internal combustion engine which includes means to stop the flow of air through the turbocharger compressor when the engine is operating at low speed to reduce resistance to rotation of the turbocharger. The air flow is reestablished automatically upon increase in speed or load of the engine and turbocharging is commenced without undue delay because the turbocharger compressor is already rotating at a relatively high rate of speed.

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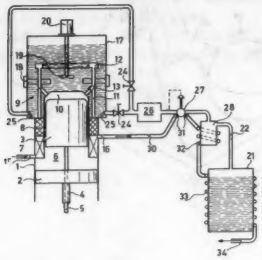
**3,651,637**
**HOT GAS ENGINE**

Johann Schroder, Aachen, Germany, and Roland Anton Johan Otto Van Witteveen, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 25, 1969, Ser. No. 860,992
Claims priority, application Netherlands, Sept. 30, 1968, 6813986
Int. Cl. F03g *7/06*
U.S. Cl. 60—24 10 Claims

Apparatus for converting heat energy into mechanical energy, particularly a hot-gas engine, in which a working medium performs a cycle between an expansion space of higher temperature and a compression space of lower tem-

perature, there being provided a heating system for supplying heat to the expansion space and a cooler for conducting away heat form the compression space. The heating system includes a reaction vessel containing a metal mixture heatable to a liquid phase and an oxydizing agent reservoir con-



taining the oxydizing agent in the liquid phase, the oxydizing agent being supplied in a dosed gaseous form to the reaction vessel for exothermic reaction with the metal. The cooling water is passed from the cooler to the reservoir to provide heat from partially evaporating the liquid oxydizing agent therein.

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**3,651,638**

**INTERNAL COMBUSTION ENGINE**

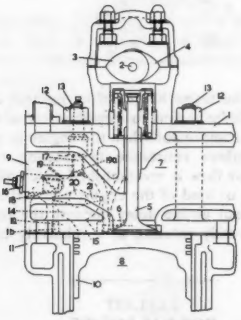
**Charles Lindsay Goodacre, London, England, assignor to F.I.A.T. S.p.A., Turin, Italy**

**Filed July 8, 1970, Ser. No. 53,154**

**Claims priority, application Great Britain, July 8, 1969, 34,368/69**

**Int. Cl. F02g** *1/00*

**U.S. Cl. 60—39.6** **9 Claims**



An otto-cycle internal combustion engine having at least one cylinder, a piston reciprocable in the cylinder, an inlet valve for admitting air into the cylinder for compression by the piston, a combustion chamber externally of the cylinder, fuel injector means for injecting fuel into the combustion chamber, transfer passage means communicating the combustion chamber with the cylinder and ignition means for igniting a fuel/air mixture in the combustion chamber, the arrangement being such that combustion takes place substantially completely outside the cylinder within the combustion chamber.

**3,651,639**

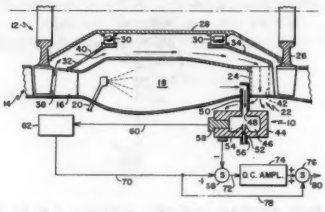
**ERROR COMPENSATED FLUIDIC TEMPERATURE SENSOR**

**Jay I. Black, Orange, Conn., assignor to Avco Corporation, Stratford, Conn.**

**Filed Dec. 29, 1969, Ser. No. 888,220**

**Int. Cl. F02b** *43/00*

**U.S. Cl. 60—39.12** **10 Claims**



The disclosure illustrates a fluidic oscillator used to measure the temperature at the turbine inlet of a gas turbine engine. The oscillator has a housing with a resonant chamber connected to the hot gas stream and to a low pressure discharge so that pressure oscillations are set up in the resonant chamber. A transducer and an analog device convert the frequency of the pressure oscillations into a DC analog signal. The housing of the oscillator is cooled and a thermocouple and modifying circuitry are used to compensate the analog signal for the heat transfer from the oscillator housing to the cooling air. In another embodiment, a heat flow sensor is used to compensate the analog signal.

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**3,651,640**

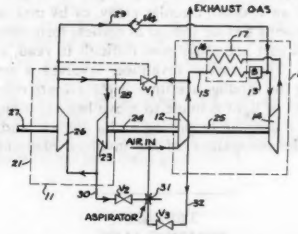
**GAS TURBINE ENGINE WITH AERODYNAMIC TORQUE CONVERTER DRIVE**

**John Nicita, Ann Arbor, Mich., assignor to Power Technology Corporation, Ann Arbor, Mich.**

**Filed Sept. 25, 1970, Ser. No. 75,612**

**Int. Cl. F02c** *9/02, 9/14*

**U.S. Cl. 60—39.24** **14 Claims**



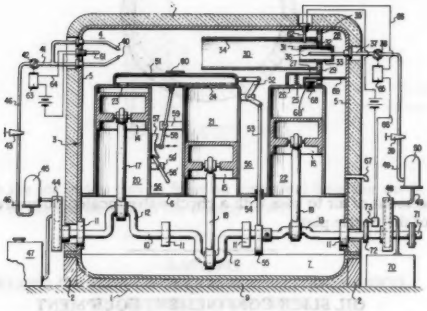

A gas turbine engine and an aerodynamic torque converter coupled through fluid lines such that the aerodynamic torque converter is filled with a compressible fluid and a hydraulic system for controlling the coupling between the gas turbine engine and aerodynamic torque converter to vary the density of the compressible fluid during starting, idle, and normal operation.

3,651,641

## ENGINE SYSTEM AND THERMOGENERATOR THEREFOR

James Lyell Ginter, Bridal Veil, Oreg., assignor to Ginter Corporation, Portland, Oreg.

Filed Mar. 18, 1969, Ser. No. 808,073
Int. Cl. F02g 1/02; F02d 1/06, 35/02
U.S. Cl. 60—39.26 32 Claims



This invention combines ICE and ECE principles in a single engine which provides working fluid at pressures and temperatures which are nearly constant, after start-up, in which fuel is burned in response to a decrease in fluid pressure as fluid is withdrawn while at the same time resupplying air compressed adiabatically to provide ignition temperature. When products of combustion are above permissible operating temperature water is supplied to absorb the entire heat of combustion becoming superheated steam to double the working fluid, without external cooling.

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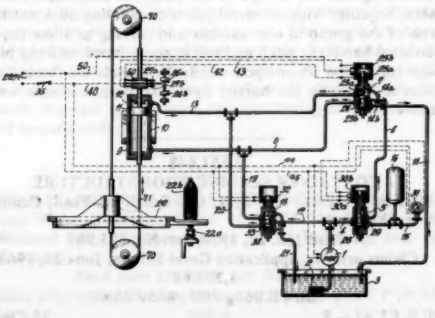
3,651,642

## HYDRAULIC CONTROL APPARATUS

Ernst Bauch, Brodesholm, and Bruno Eigenwald, Neumuenster, both of Germany, assignors to Neumunstersche Maschinenen-und Apparatebav Gesellschaft m.b.H., Neumuenster, Germany

Filed May 11, 1970, Ser. No. 36,090
Claims priority, application Germany, May 12, 1969, P 19 24 177.1
Int. Cl. F15b 1/02
U.S. Cl. 60—51 8 Claims



A control apparatus by which the ring rail of a twisting machine, and also the hydraulic, pump driven motor raising and lowering the same, are automatically moved to an end position if an interruption of the electric power supply to the pump occurs in an intermediate position of the ring rail. In this event, a spring biassed electromagnetic control valve, when deenergized, causes the flow of pressure fluid from a pressure accumulator to the hydraulic motor which is driven to complete the started reciprocating stroke.

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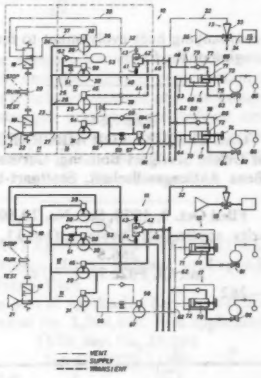
3,651,643

## PNEUMATIC ANNUNCIATOR SYSTEM

Robert S. Hurrah, 4108 Dupont, Houston, Tex.

Filed July 21, 1970, Ser. No. 56,892
Int. Cl. F01k 13/02
U.S. Cl. 60—105 39 Claims



As a representative embodiment of the present invention, pressure-responsive indicators are coupled to suitable transducers monitoring selected operating conditions of an industrial machine. Pneumatic controls are arranged for providing first pneumatic signals when these operating conditions reach a predetermined value and producing second pneumatic signals should any of the operating conditions vary from its selected range. Other pneumatic controls are uniquely arranged for responding to the second signals to produce a brief third pneumatic signal which is effective to operate only the associated indicator while the other unaffected indicators are positively retained in their safe indicating positions. The indicators of the present invention are adapted to be stacked together and respectively include a number of passages adapted to coincide with the matching passages in the other indicators. One set of these passages in each indicator can be isolated from the other set by orienting the indicator in one position in relation to the other indicators. A second set of these passages is coupled to an alternately-positionable spool in each indicator which is uniquely arranged to select which of the passages in this other set is to be coupled to the pressure-responsive element in that indicator.

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3,651,644

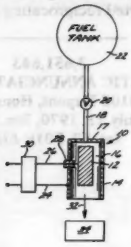
## APPARATUS FOR INITIATING DECOMPOSITION OF AN EXOTHERMIC PROPELLANT

Bernard P. Breen, South Pasadena; Bill R. Lawver, Glendora, and James R. Kliegel, Redondo Beach, all of Calif., assignors to Marshall Industries, San Marino, Calif.

Original application Sept. 25, 1967, Ser. No. 670,242. Divided and this application June 25, 1969, Ser. No. 836,504
Int. Cl. F02k 9/02; B01k 3/00; B01j 7/00
U.S. Cl. 60—203 4 Claims

An apparatus for initiating decomposition of exothermic propellants by developing an electric potential across spaced

electrodes located in the propellant inlet stream, the electric potential being at a level high enough to effect decomposition and accompanying heat evolvement to facilitate starting of a rocket engine or the like.

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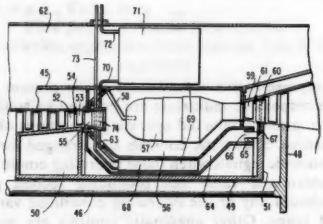
**3,651,645**

**GAS TURBINE FOR AIRCRAFTS**

**Hubert Josef Grieb, Stuttgart-Botnang, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany**

**Filed Oct. 9, 1970, Ser. No. 79,508**
**Claims priority, application Germany, Oct. 11, 1969, P 19 51 356.5**
**Int. Cl. F02c** *7/12, 7/14*
**U.S. Cl. 60—262** **16 Claims**



A gas turbine for aircrafts, particularly jet engines with air-cooled turbine blades whereby the cooling air is taken off either directly or indirectly from a compressor stage; a heat-exchanger with a closed circulation is provided in the cooling system whose heat-absorbing part is arranged in a cooling air channel disposed between the compressor and the turbine rotor.

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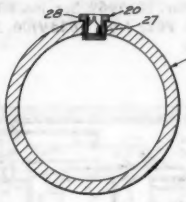
**3,651,646**

**PNEUMATIC BARRIER SYSTEM FOR WATER SURFACES**

**Heinz Grunau, Lubeck, Germany, assignor to Rudolf Harmstorf, Hamburg, Germany**

**Filed May 21, 1970, Ser. No. 39,262**
**Int. Cl. B01d** *23/00*
**U.S. Cl. 61—1 R** **3 Claims**

A system for the confinement of pollutants on water surfaces until collected or chemically dispersed. The system effects its confining action by generating a curtain or barrier of air bubbles which at the surface of the water form a series of overlapping aerated water hills capable of blocking the passage of a pollutant, such as oil film, therethrough. The system is designed to enable it to provide a continuous barrier of aerated water hills over long period of use and even though it may be installed on harbor and waterway bottoms where silty conditions prevail. This is accomplished by a pipe for supplying compressed gas to an outlet comprising a nozzle plate having an orifice of a size to allow a metered amount of air to pass with a check valve located downstream of the nozzle plate.



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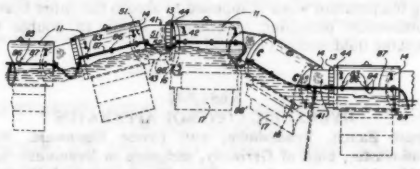
**3,651,647**

**OIL SLICK CONFINEMENT EQUIPMENT**

**Edmond Flaviani, 719 28th Avenue, San Francisco, Calif.**

**Filed Sept. 17, 1970, Ser. No. 73,001**
**Int. Cl. E02b** *15/04*
**U.S. Cl. 61—1 F** **5 Claims**



The disclosure relates to a device for confining pollution material floating on the surface of water to a given area for subsequent collection, storage or other disposition thereof. The device comprises a variable group of individual water-tight floatable barrels rising above the water and affording a barrier against the escape of the pollution material from the area, together with universal joints connecting adjacent barrels of the group to one another and serving to allow the individual barrels to pitch and roll in accordance with the pitch and roll of the water upon which the barrels are floated and thus to maintain the barrier operative despite undue water movement.

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**3,651,648**

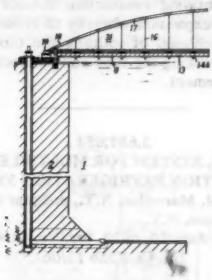
**CONTAINER SEALING ROOF STRUCTURE**

**William Hamilton, Mill Brae, Old Guildford Road, Camberley, England**

**Filed Jan. 17, 1969, Ser. No. 791,989**
**Claims priority, application Great Britain, June 26, 1968, 4,299/68**
**Int. Cl. B65g** *5/00;* **B65d** *25/00*
**U.S. Cl. 61—.5** **10 Claims**

A container for liquefied gas has a domed cover sealed to the top edge of the sides of the container. The cover is supported on a lattice of beams. A horizontal tray covering the opening in the top of the container is suspended from the beam—lattice and is filled with water frozen to ice by the

liquefied gas. A band sealed to the top edge of the sides of the container around the tray has its upper edge turned over



into the ice in the tray to form an inner seal between the inside of the container and the domed cover.

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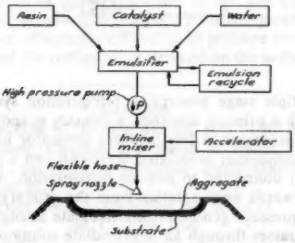
**3,651,649**

## STABILIZATION OF SOIL WITH WATER-IN-VINYL ESTER RESIN EMULSIONS

**Daniel J. Najvar, Lake Jackson, Tex.; Christ F. Parks; Garry A. Bennett, and Kenneth H. Nimerick, all of Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Aug. 26, 1970, Ser. No. 66,923**
**Int. Cl. C08g *45/14*; E02d *3/14***
**U.S. Cl. 61—36 R** **11 Claims**




Catalyzed emulsions of a water phase dispersed in a continuous phase of a polymerizable vinyl ester resin containing a copolymerizable monomer are prepared and applied to a soil or aggregate surface. The emulsion is then allowed to cure to a hard cross-linked resin having entrapped therein dispersed droplets of the water phase. The emulsions cure readily at ambient temperatures and may be formulated to cure in as short a time as a few minutes. The resulting cured emulsion-soil (or aggregate) surface is impermeable to liquids, resistant to corrosion and weathering and provides a load bearing surface.

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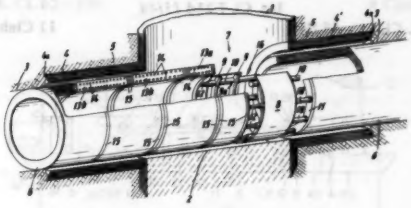
**3,651,650**

## APPARATUS FOR MAKING UNDERGROUND PASSAGES

**Bruno Weiss, Kolbergerstrasse 11, 4021 Metzkausen, and Richard Weiss, Spichernstrasse 52, 41 Duisburg, both of Germany**

**Filed June 29, 1970, Ser. No. 50,729**
**Claims priority, application Germany, June 30, 1969, P 19 33 066.6**
**Int. Cl. E01g *3/00***
**U.S. Cl. 61—42** **11 Claims**

An apparatus for forcing tubular elements through soil so as to make underground passages. Hydraulic jacks are mounted in a cylindrical casing having open ends, for reciprocation axially of the casing. At least one elongated tubular element is provided which is to be axially forced into the soil by the jacks and which has a circumferentially complete annular cross section. A plurality of pressure-transmitting members are provided which are to be interposed between a trailing end of the tubular element and the hydraulic jacks. These pressure-transmitting members each have a circumferentially complete annular cross section corresponding to that of the tubular element and are composed essentially of high-strength reinforced centrifugal concrete provided with annular metallic reinforcing rings embedded at opposite axial ends of the respective pressure-transmitting member.



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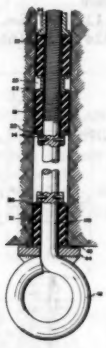
**3,651,651**

## SHAFT SECUREMENT STRUCTURE

**Lee Triplett, Magna, Utah, assignor to Expando Products Company, Magna, Utah**

**Continuation-in-part of application Ser. No. 748,065, July 26, 1968, now Patent No. 3,504,498. This application Apr. 3, 1970, Ser. No. 25,386**
**Int. Cl. E21d *21/00***
**U.S. Cl. 61—45 B** **2 Claims**



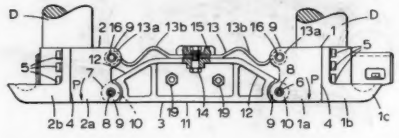
The present invention relates to shafts which are to be secured in a variety of structures, for example, mining formations, drill holes, casings, and the like, and is directed to a suitable, elongate shaft construction incorporating compression-lock friction sleeves at a remote end thereof which can be compressed and thereby expanded in a formation simply by rotating the shaft at a remote point relative to the compression sleeves. In a preferred embodiment of the invention, a stabilizing bushing is employed near the entrance to the formation or dill hole, this so that forces in shear against the shaft and proximate the exterior of the bore of which the shaft is mounted, cannot dislodge a compression-friction lock of the shaft within the bore.

3,651,652

## SUPPORT ASSEMBLIES FOR MINERAL MINES

Franz Beulker, Langern, and Erich Hoffmann, Altlunen, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Wethmar near Lunen, Westfalia, Germany

Filed Mar. 24, 1970, Ser. No. 22,318
Claims priority, application Germany, Apr. 3, 1969, P 19 17 317.2
Int. Cl. E21d 15/44
U.S. Cl. 61—45 D 11 Claims



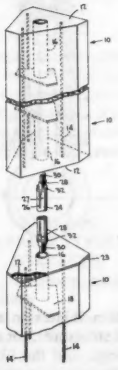
A support assembly with two frames each having telescopic props carried by base members pivotably interconnected to a rigid member disposed therebetween. The rigid members are connected through a shifting device usable to alternately advance the frames. Each frame has a leaf spring attached at its center to the rigid member and pivotably connected at its ends to the base members or props. Between the center and each end of the spring is a portion which follows a sinusoidal course. Upon pivotal movement of a base member and the rigid member in one direction the associated portion of the spring elongates and eventually limits the amount of pivotal movement. Pivotal movement in the opposite direction is limited when the portion of the spring engages an abutment surface of the rigid member.

3,651,653

## SECTIONAL PILE AND COUPLING MEANS

William J. Mouton, Jr., New Orleans, La., assignor to Charles A. Kronlage, Jr. and Gerard J. Gillen, Jr., New Orleans, La., part interest to each

Filed June 12, 1970, Ser. No. 45,644
Int. Cl. E02d 5/22; F16b 7/00, 9/00
U.S. Cl. 61—53 12 Claims



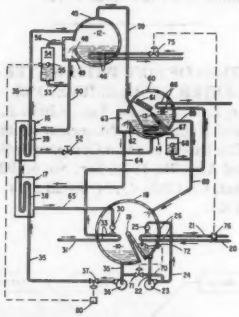
A coupling means for interconnecting the several sections of a sectional pile structure which includes tubes of deformable material embedded in and opening through the adjacent ends of the pile sections, and elongated connectors also of deformable material having bifurcated end portions for reception in the respective tubes. Wedges operatively associated with these end portions engage abutment within the tubes to separate the furcations, forcing them outwardly into expanding engagement with the tube to locally expand the latter and thereby to provide an interlock between each tube and the connector. Concurrently with the local expansion of each tube in a given direction transversely to its length, there occurs a compensating contraction thereof in a direction transverse to its expansion whereby to relieve stress and to minimize the likelihood of splitting the tube, while at the same time, interlocking the tube and connector against relative angular movement.

3,651,654

## CONTROL SYSTEM FOR MULTIPLE STAGE ABSORPTION REFRIGERATION SYSTEM

Stanley J. Rachfal, Marcellus, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 10, 1970, Ser. No. 62,466
Int. Cl. F25b 15/06
U.S. Cl. 62—103 4 Claims



A multiple stage absorption refrigeration system is provided with a primary absorber, a primary evaporator, a high pressure generator, a low pressure generator having a high pressure condenser associated therewith and a low pressure condenser connected to provide refrigeration. A centrifugal pump forwards weak solution from the primary absorber to the high pressure generator. Intermediate strength absorbent solution passes through an intermediate solution passage extending between the high pressure generator and the low pressure generator. A steam valve controls heat input to the high pressure generator in response to the leaving chilled water temperature from the evaporator. Improved economy and stability is achieved by a solution valve, in the weak solution passage between the primary absorber and the high pressure generator, which is adjusted in accordance with a sensed level of solution in the intermediate solution passage, so that the quantity of weak solution supplied to the high pressure generator is a function of the difference in pressure between the generators.

3,651,655

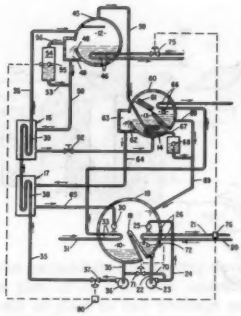
## CONTROL SYSTEM FOR MULTIPLE STAGE ABSORPTION REFRIGERATION SYSTEM

Eddie L. Dyre, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 10, 1970, Ser. No. 62,467
Int. Cl. F25b 15/06
U.S. Cl. 62—103 4 Claims

A multiple stage absorption refrigeration system is provided with a primary absorber, a primary evaporator, a high pressure generator, a low pressure generator having a high pressure condenser associated therewith and a low pressure condenser connected to provide refrigeration. A centrifugal pump forwards weak solution from the primary absorber to

the high pressure generator. Intermediate strength absorbent solution passes through an intermediate solution passage extending between the high pressure generator and the low pressure generator. A steam valve controls heat input to the high pressure generator in response to the leaving chilled water temperature from the evaporator. A solution valve in



the weak solution passage between the primary absorber and the high pressure generator is adjusted in accordance with a sensed level of solution in the intermediate solution passage, and the position of the stream valve so that the quantity of weak solution supplied to the high pressure generator is a direct function of both the difference in pressure between the generators and the refrigeration demand on the system.

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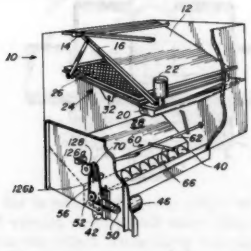
**3,651,656**

## AGITATOR FOR STORAGE BIN OF ICE CUBE MAKER

**Harold H. Esser, Chicago, and Ralph B. Olson, Lombard, both of Ill., assignors to Schneider Metal Manufacturing Co., Chicago, Ill.**

**Filed Dec. 31, 1969, Ser. No. 889,473**
**Int. Cl. F25c *1/00***
**U.S. Cl. 62—137** **2 Claims**



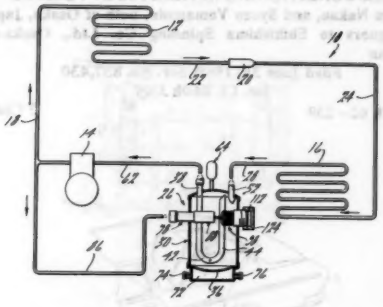
An automatic apparatus for mechanically agitating ice cubes stored in the storage bin of an ice cube maker to obviate cube agglomerates resulting from fusion of stored cubes to each other. The agitator system of the invention includes means for ensuring that agitation takes place automatically at spaced time intervals for finite limited periods.

**3,651,657**

## AIR CONDITIONING SYSTEM WITH SUCTION ACCUMULATOR

**Edward W. Bottum, 9357 Spencer Road, Brighton, Mich.**

**Filed Jan. 26, 1970, Ser. No. 5,811. The portion of the term of the patent subsequent to Oct. 5, 1988, has been disclaimed.**
**Int. Cl. F25b *1/00***
**U.S. Cl. 62—196** **8 Claims**



A vehicle air conditioning system is provided. The system comprises the usual compressor, evaporator and condenser connected together in operative relationship. Capillary tube refrigerant expansion means are provided between the condenser and evaporator. A suction accumulator is provided between the evaporator and compressor so that the system will be effective when the compressor operates at variable speeds, the condenser is subjected to variable ambient temperatures and the evaporator is subjected to a variable load. Bleedoff means from the output of the compressor are connected to the suction accumulator. Control means are provided for selectively injecting the relatively high pressure, high temperature gases of the compressor output into the accumulator to maintain the pressure within the accumulator at a substantially constant level.

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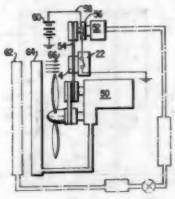
**3,651,658**

## DEVICE FOR PREVENTING AN ENGINE FROM OVERHEATING

**Keizo Kushida, Anjyo, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 21, 1970, Ser. No. 82,698**
**Int. Cl. B60h *3/04***
**U.S. Cl. 62—228** **6 Claims**



A device is provided for preventing overheating of an automotive vehicle engine also used for operating an air-conditioning system for the vehicle which features an engine-driven belt pulley having an electrically conducting plate attached to one side, a magnet in juxtaposed relation to the plate and rotatably disposed on the same axis as the plate, resilient means connecting the magnet and a fixed member for permitting angular displacement of the magnet cor-

responding to a torque acting thereon, and a cam connected to the magnet and operative to open and close a switch for shutting off or starting the compressor unit of the air conditioner, depending upon the torque being experienced, for thereby preventing the engine from becoming overheated when operated at speeds and under such loads which normally might cause overheating.

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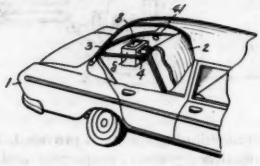
3,651,659

## AIR-CONDITIONING APPARATUS IN VEHICLE

Minoru Nakao, and Syozo Yamamoto, both of Osaka, Japan, assignors to Shikishima Spinning Co. Ltd., Osaka-shi, Japan

Filed June 30, 1969, Ser. No. 837,430
Int. Cl. B60h 3/04
U.S. Cl. 62—239 3 Claims



An apparatus wherein an automobile air conditioner is provided with air recirculating means, air cooling means, and an air filter of a texture capable of removing smoke from the air, and with means operated for effectively inserting the air filter in, and removing it from, the path of air circulating through the cooling means depending on whether the air in the passenger compartment is or is not so smoke laden as to require smoke removal therefrom.

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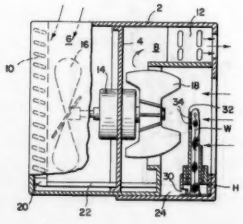
3,651,660

## CONDENSATE DISCARDING DEVICE FOR AIR CONDITIONER

Vincente Rodriguez Quiros, 113 First Street, Jardinez del Caribe, Ponce, P.R.

Filed May 6, 1970, Ser. No. 35,074
Int. Cl. F25d 47/00
U.S. Cl. 62—279 3 Claims



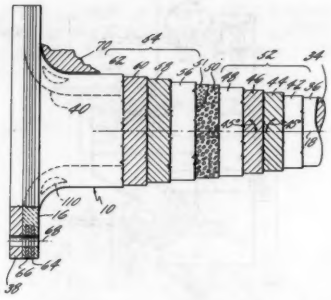
A condensate discarding device for a refrigerator apparatus. The condensate is collected in a sump and is raised by a capillary device fixed to the sump to interset the air stream which flows toward the condenser unit. The air stream picks up the moisture and carries it through the condenser where it is discarded.

3,651,661

## COMPOSITE SHAFT WITH INTEGRAL END FLANGE

Donald C. Darrow, Fairfield, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 2, 1970, Ser. No. 7,722
Int. Cl. F16c 1/00
U.S. Cl. 64—1 53 Claims



A composite shaft with an integral end flange fabricated of a plurality of layers of high modulus fibers of selected fiber orientation positioned between and bonded to protective outer and inner layers as required and to one another such that each layer extends the full length of the shaft and the flange. The shaft layers may be of sandwich construction and may be asymmetric and the flange periphery may include doublers of bearing material.

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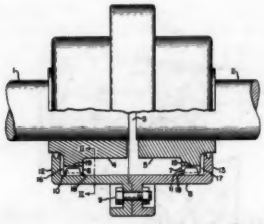
3,651,662

## GEAR TYPE FLEXIBLE COUPLING

Herbert N. Hoffman, Lunenburg, Mass., assignor to General Electric Company

Filed Oct. 19, 1970, Ser. No. 81,850
Int. Cl. F16d 3/18
U.S. Cl. 64—9 R 6 Claims



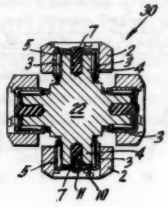
A flexible coupling of the gear type is provided with mating teeth that have a substantial radial clearance between the major diameters of the internal and external gear teeth. Provisions for centering the floating member are located at the minor diameters of the respective gear teeth. In this configuration of coupling gear teeth, the lubricating oil is allowed to flow freely through the aforesaid radial clearance, thereby tending to prevent solids, centrifuged out of the lubricant as a result of rotation, from impairing coupling operation.

3,651,663

## UNIVERSAL JOINT CONSTRUCTION

Gunter Lange, Siedlung Gluckauf, and Jurgen Ulderup, Haldem, both of Germany, assignors to Lemforder Metallwaren AG, Lemforde, Hannover, Germany

Filed July 22, 1970, Ser. No. 57,117
Claims priority, application Germany, Aug. 18, 1969, P 19 41 975.1
Int. Cl. F16d 3/26
U.S. Cl. 64—17 A 7 Claims



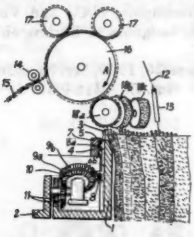
A universal joint particularly for steering devices of motor vehicles includes pins of its cross link assembly which are mounted by means of plain or ball bearings and which are supported elastically in an axial plane. The axial support is effected by a pinlike buffer which is mounted within a bore defined in an end face of each pin and which bears against a portion of the housing of the connecting fork member.

3,651,664

## METHOD OF PRODUCING ARTIFICIAL FURS OF NONUNIFORM FIBER DENSITY

Louis Collez, deceased, late of Saint-Die, France (by Emiliene Marie Aussel and Marie Elisabeth Lucie Collez, representatives, both of 76 Avenue Carnot, Bordeaux, France)

Continuation-in-part of application Ser. No. 598,402, Dec. 1, 1966, now abandoned which is a Continuation-in-part of application Ser. No. 480,005, Aug. 16, 1965. This application May 18, 1970, Ser. No. 38,073
Int. Cl. D04b 9/14
U.S. Cl. 66—9 B 1 Claim



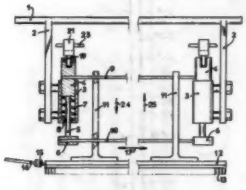
Artificial fur is produced having ridges or stripes of long fiber pile of varying density with short fiber pile of uniform density within the ridges. To achieve this, an ordinary Wildman Jacquard knitting machine is utilized having at least three doffer rolls for each yarn feed. Two of the doffer rolls are rotated several times during the passage before same of selected groups of needles and long fibers are fed to each of these doffer rolls at less than the capacity of the rolls to receive same. The other doffer roll is fed with short fibers in the conventional manner. The needles are selectively actuated to produce the stripes or ridges by removing fibers from the respective rolls.

3,651,665

## GUIDE BAR CONTROL FOR KNITTING MACHINES

Augustin Perrier, Lyon, France, assignor to Manufactures Jean-Baptiste Martin, Andre Charbin & Cie, Lyon, France

Filed Mar. 5, 1970, Ser. No. 16,883
Claims priority, application France, Mar. 6, 1969, 6906176
Int. Cl. D04b 23/00
U.S. Cl. 66—86 3 Claims



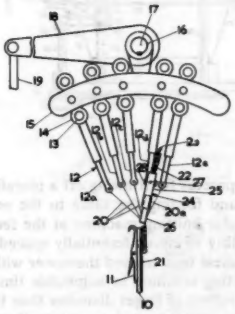
A control apparatus for use in a Raschel machine for effecting movements of the guide bar and comprising a pair of spaced bars which are bodily movable up and down by cam and spring means and on which the guide bar can slide with a reciprocating motion.

3,651,666

## SLIDING CLASP FASTENER STRINGERS

Christopher Frederic Austin, Sutton Coldfield; Philip Simpson Crowther, Sutton Coldfield; David Warren, Sutton Coldfield, and David Howitt, Birmingham, all of England, assignors to Lightning Fasteners Limited, Birmingham, England

Filed June 29, 1970, Ser. No. 50,755
Int. Cl. D04b 23/00
U.S. Cl. 66—86 9 Claims



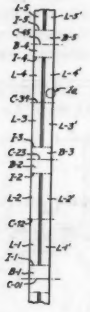
A slide fastener stringer comprises a knitted tape and a series of coupling elements secured thereto during knitting.

3,651,667

## MACHINE KNITTING

Seymour C. Titone, Birchrunville, Pa., assignor to Titone Research & Development Corporation, Burlington, N.J.

Filed July 18, 1969, Ser. No. 842,867
Int. Cl. D04b 23/02
U.S. Cl. 66—87 5 Claims



Seamless bifurcated tubular fabric warp-knit with a filigree-like net structure is provided for panty hose and like uses.

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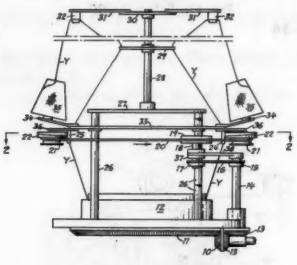
3,651,668

## YARN FEEDING MEANS FOR KNITTING MACHINES

David Pernick, 1020 Shore Boulevard, Brooklyn, N.Y.

Filed Jan. 9, 1970, Ser. No. 878,443
Int. Cl. D04b 15/48
U.S. Cl. 66—132 T 3 Claims



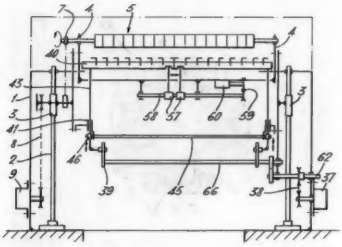
Yarn feeding apparatus for drawing off a plurality of yarns from their cones and feeding the same to the needles of a multiple feed circular knitting machine at the feeds thereof comprising a plurality of circumferentially spaced first roller s rotated by an endless tape trained thereover with the latter driven by the knitting machine in adjustable timed relation therewith, second rollers of larger diameter than the first rollers and positioned atop thereof to rotate therewith, and means to guide the yarns around the second rollers for one or more turns, then (1) to guide the yarns to and between the tape and the first rollers and away therefrom to the needles, or then (2) to guide the yarns around the first rollers for one or more turns in spaced relation to the tape thereon, the first and second rollers acting as winches, under certain conditions, upon the one or more turns of the yarns thereon.

3,651,669

## FABRIC TAKEUP FOR FLAT KNITTING MACHINES

Wolfgang Findewirth; Helmut Irmscher; Gunther Kessler, and Gunther Leubner, all of Karl-Marx-Stadt, Germany, assignors to VEB Wirkmaschinenbau Karl-Marx-Stadt Kombinat fur Wirk-und Strickmaschinenbauerzeugnisse, Karl-Marx-Stadt, Germany

Filed Oct. 28, 1970, Ser. No. 84,694
Int. Cl. D04b 15/88
U.S. Cl. 66—149 7 Claims



Fabric takeup mechanism for flat knitting machines for knitting fabrics of variable width, comprising a hook takeup including means carrying a row of hooks in a line parallel to the front edge of the fabric being knit, the hooks including a first set arranged on the left-hand side of the carrying means and a second set arranged on the right-hand side of the carrying means, the free end of each of the hooks of the first set pointing toward the left-hand edge of the fabric and the free end of each of the hooks of the second set pointing toward the right-hand edge of the fabric, means for bringing the row of hooks into engagement with the front edge of the fabric at the beginning of a knitting operation, a set of a plurality of coaxial takeup rolls and a set of a like plurality of coaxial pressure rolls each cooperating with a respective takeup roll to define a nip, the sets of rolls being positioned relative to the row of hooks to receive in the nips from the row of hooks the front edge of the fabric, and means for disengaging the row of hooks from the front edge of the fabric after the front edge of the fabric has been received in the nips.

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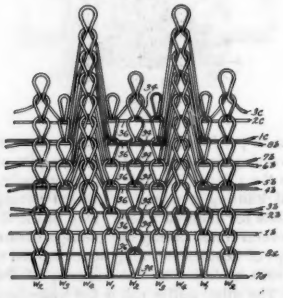
3,651,670

## HOSIERY-GIRDLE-TYPE PANTYHOSE

Aaron Burleson, Burlington, N.C., and Vaughn H. Butler, Harriman, Tenn., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed June 26, 1969, Ser. No. 836,997
Int. Cl. A41b 9/02
U.S. Cl. 66—177 3 Claims



A hosiery-girdle-type pantyhose comprising two seamless hose sewn together wherein in place of a welt, there is a com-

pressive, stretch fabric integrally knit with the hose to form a compressive girdle portion. The girdle portion of each hose has front and rear panels which are knit so as to provide more fabric in the rear panel than in the front panel with the front panel averaging less stitch loops per course than the rear panel for the same number of wales in the course. Fewer stitches per course in the front panel than the rear panel are provided by knitting stitch loops only in spaced-apart wales in the front panel for at least some of the courses and floating the yarn in these courses between the spaced-apart wales.

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**3,651,671**

**HIGH PRESSURE STEAMER**

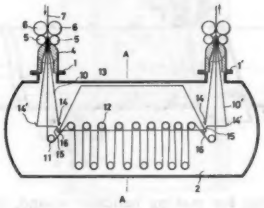
**Yoshikazu Sando, and Masao Takau, both of Wakayama, Japan, assignors to Sando Iron Works Company Limited Wakayama-shi, Wakayama-ken, Japan**

**Filed Feb. 4, 1970, Ser. No. 8,596**

**Claims priority, application Japan, June 24, 1969, Sept. 20, 1969, Sept. 22, 1969, Nov. 1, 1969, Nov. 20, 1969; 44/59950, 44/74925, 44/75413, 44/103910, 44/93185**

**Int. Cl. D06c *1/00***

**U.S. Cl. 68—5 E** **3 Claims**



High pressure steamer for treating cloth and other textile goods with saturation steam of high temperature and high pressure provided with mechanisms to preserve security and safety operation for preventing dripping onto the cloth being treated, for providing safety guarding on the highly heated and pressurized drum body of the high pressure steamer, for preventing soiling as well as for washing of guide rolls which feed cloth within said drum body, and for regulating tension loaded on the textile goods being fed through guide rolls installed within said drum body.

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**3,651,672**

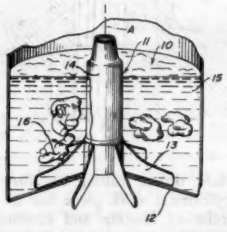
**LAUNDRY MACHINE AGITATOR**

**Keith D. Salisbury, St. Joseph, Mich., assignor to Richard R. Walton, Boston, Mass.**

**Continuation of application Ser. No. 464,706, June 17, 1965, now abandoned. This application Jan. 4, 1968, Ser. No. 695,805**

**Int. Cl. D06f *13/02***

**U.S. Cl. 68—134** **1 Claim**



A washing machine agitator having a centerpost and a plurality of vanes molded integrally therewith and extending radially outwardly from a lower portion thereof. The vanes are deflectable to provide improved low wear, high efficiency washing action.

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**3,651,673**

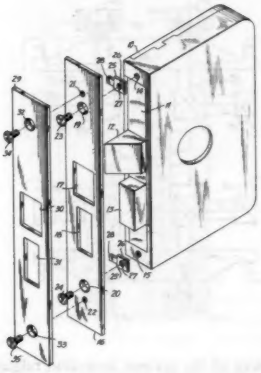
**MORTISE LOCK HAVING ADJUSTABLE FACE PLATE**

**Edward J. Sendrowski, Fitchburg, Mass., and Jacob K. Maki, Westminster, N.Y., assignors to ILCO Corporation, Fitchburg, Mass.**

**Filed Dec. 28, 1970, Ser. No. 101,535**

**Int. Cl. E05b *9/06***

**U.S. Cl. 70—450** **4 Claims**



A mortise lock including adjustment means permitting the face plate to be fixed in relation to the lock casing in three selected positions, notably, square, right hand bevel and left hand bevel.

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**3,651,674**

**APPARATUS FOR GUIDING A PRODUCT UNDERGOING TRANSFORMATION, AND THE USE THEREOF IN A WIRE MILL**

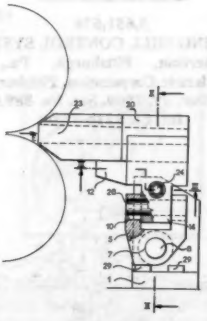
**Robert Petit, Rosny-Sous-Bois, France, assignor to Societe Nouvelle, Spidem, Paris, France**

**Filed Oct. 22, 1969, Ser. No. 868,311**

**Claims priority, application France, Oct. 24, 1968, 171285**

**Int. Cl. B21d *55/00*; B21b *39/20***

**U.S. Cl. 72—5** **8 Claims**



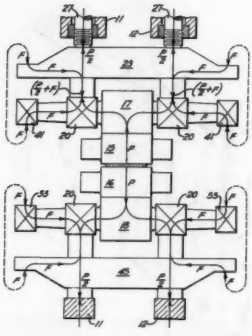
Device which, by means of an appropriately calibrated rupture pin, enables damage to a machine to be prevented during any clogging which might occur in the product being transformed.

3,651,675

## AUTOMATIC GAUGE CONTROL OF STRIP IN ROLLING MILL EMPLOYING BACKUP ROLL BENDING

Morris Denor Stone, Pittsburgh, Pa., assignor to United Engineering and Foundry Company, Pittsburgh, Pa.

Filed Oct. 10, 1969, Ser. No. 865,331
Claims priority, application Great Britain, Oct. 21, 1968, 49,805/68
Int. Cl. B21b *37/08*
U.S. Cl. 72—8 2 Claims



The disclosure of the present invention relates to the construction and operation of a rolling mill wherein automatic control of the gauge of the strip being rolled is achieved. More particularly, it relates to a rolling mill provided with mechanisms for bending either or both of the work rolls or backup rolls, including backup roll necks, and thereby control the longitudinal gauge of the material. It provides in the preferred form a four-high rolling mill including means for bending the backup rolls thereof so as to control the thickness of the material along its longitudinal axis. In combination with the backup roll bending mechanism and the usual screwdown mechanism, there is provided a beam so arranged with respect to these two elements that the force of the backup crown control system is self-contained and not imposed upon the mill housing. Use of the beam with respect to both backup rolls in this manner assures that the forces of the backup crown control mechanism, which would otherwise impose additional stretch on the housing, is nullified so that there is less need of continually adjusting the roll gap for automatic gauge control.

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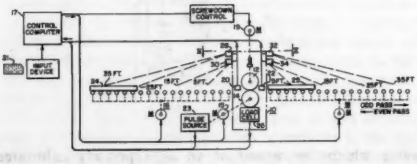
3,651,676

## ROLLING MILL CONTROL SYSTEM

James D. Robertson, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 31, 1969, Ser. No. 889,665
Int. Cl. B21b *37/00*
U.S. Cl. 72—12 6 Claims




A rolling mill stand, under particularly tandem workpiece rolling conditions where more than one workpiece passes through the stand for a given setting of that stand, is provided with a control system including a plurality of workpiece position sensors operative such that after a given workpiece has passed through the rolls of the mill stand the presence of any additional workpiece also desired to be passed through the stand with the same roll opening setting is sensed before the roll opening of the stand is changed to the next desired setting for any scheduled next workpiece passage through the stand.

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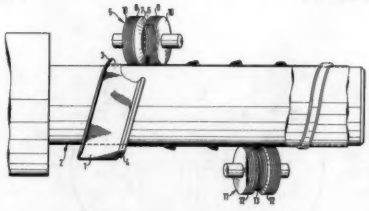
3,651,677

## APPARATUS FOR HELICALLY WINDING STRIP INTO A LOCK-SEAMED PIPE OR TUBE

Emil Siegwart, Michael-Blatter-Strasse 6, 6603 Sulzbach (Saar), Germany

Filed Feb. 16, 1970, Ser. No. 11,376
Int. Cl. B21c *37/12*; B23k *31/02*
U.S. Cl. 72—50 10 Claims



The apparatus for making helically wound, lock-seamed pipes of U.S. Pat. No. 3,122,115 is improved for use with heavier strip material by setting the axes of the pressure roller and flattening roller at an angle to the axis of the driven mandrel corresponding to the helix angle of the lock seam, by providing the strip engaging faces of the rollers with sharp edged ribs, and mounting the rollers so that the ribs bite into the strip, and by spacing the rollers apart along the seam by an angle of at least 360°.

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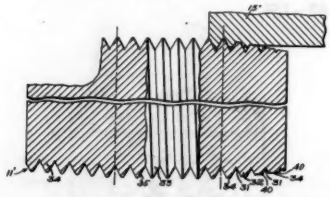
3,651,678

## TRUNCATED THROUGH FEEDING THREAD ROLLING DIE

Elmer S. Zook, Princeton, and Paul W. Ronn, Gardner, both of Mass., assignors to Reed Rolled Thread Die Co., Holden, Mass.

Filed Nov. 6, 1968, Ser. No. 773,851
Int. Cl. B21h *3/04*, *3/02*; B23g *7/02*
U.S. Cl. 72—103 2 Claims



A through feed thread rolling die for rolling external threads on a cylindrical work piece has an external thread thereon with relieved starting and finishing sections, the starting relief providing flat crests which form a predetermined angle with the roll axis and taper to a diameter at the starting end less than the mean height of the fully formed threads. A modified version tapers the starting section at a larger angle than the predetermined angle of the crests

thereby reducing the length of the starting section. The invention includes the method of metal movement caused by the die in the formation of the thread.

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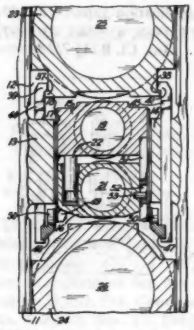
3,651,679
ROLLING MILL
Charles Storer Shumaker, Glenshaw, Pa., assignor to United Engineering and Foundry Company, Pittsburgh, Pa.
Filed Dec. 9, 1969, Ser. No. 883,522
Claims priority, application Great Britain, Jan. 3, 1969, 585/69
Int. Cl. B21b *31/08*
U.S. Cl. 72—238 6 Claims



The disclosure of the present invention relates to a rolling mill having indented housing posts to allow minimum length work roll chocks to be employed. The work roll chocks and the backup roll chocks are constructed with a minimum of irregular and difficult-to-machine surfaces. In addition, the rails and wheels used to quickly remove and replace the work rolls are connected in a very simple and economical manner to the backup chocks and work roll chocks, respectively, by separate connected bars.

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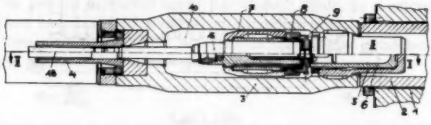
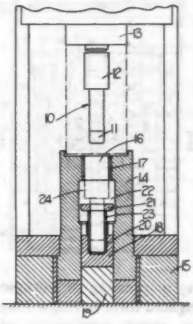
3,651,680
TUBE PRESS WITH MANDREL ADJUSTMENT
Horst Hans Groos, Metzkausen, Germany, assignor to Schloemann Aktiengesellschaft, Dusseldorf, Germany
Filed Dec. 10, 1969, Ser. No. 883,901
Int. Cl. B21c *23/20, 25/00*
U.S. Cl. 72—265 6 Claims



Some tube presses need a device for adjusting both the longitudinal position and the angular position of the mandrel. The longitudinal position of the mandrel is adjusted by rotating a nut on a spindle connected to the mandrel. Previously such devices have included separate coupling members for preventing rotation of the spindle with respect to the nut and rotation of the spindle with respect to the press. I now provide a single coupling member which is rotationally fixed with respect to the spindle and which can move between two positions, in one of which the spindle is rotationally fixed with respect to the nut and in the other of which the spindle is rotationally fixed with respect to the press.

3,651,681
APPARATUS FOR USE IN FORMING SHELLS FROM BILLETS
Ronald W. Eames, Wingerworth, Chesterfield, England, assignor to The Chesterfield Tube Company Limited, Chesterfield, England
Filed July 28, 1969, Ser. No. 845,253
Claims priority, application Great Britain, Aug. 1, 1968, 36,717/68
Int. Cl. B21c *23/18*
U.S. Cl. 72—267 1 Claim



Apparatus for forming shells from billets comprising a punch having a billet-engaging nose portion at its leading end and a supporting portion which is of greater diameter than the nose portion, a billet supporting assembly which comprises a hollow housing having at its upper end an aperture through which the nose portion and the supporting portion of the punch can extend and a recessed billet block in the interior of the housing together with a nose portion supporting ring, said housing having a laterally directed aperture through which a billet can be inserted into the recess of the billet block and from which a shell extruded from a billet by said punch can be withdrawn.

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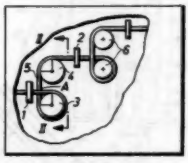
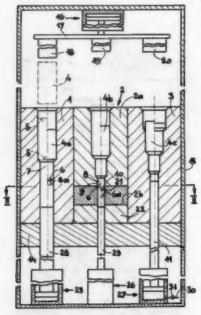
3,651,682
WIRE DRAWING MACHINE
Werner Henrich, 6349 Horbach, Am Horbach, Germany
Filed June 5, 1969, Ser. No. 830,741
Claims priority, application Germany, Mar. 29, 1969, P 19 16 256.2
Int. Cl. B21c *1/04*
U.S. Cl. 72—281 2 Claims



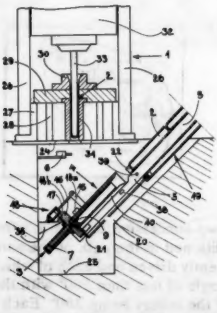
Between two successive dies of a wire drawing machine there are positioned in the path of the wire two rollers which are independently driven and each of which contacts the wire through an angle of less than 360° with the sum of the angles of contact of the rollers being 360°. Each of the rollers has a conical taper in the axial direction from the advancing to the departing portions of the wire on a roller and the rollers are positioned with their adjacent peripheral surfaces moving in opposite directions.

3,651,683
COLD MOULDING PRESS
Rudolf Liebergeld, Gernotstrasse 51/55, 85 Nurnberg, Germany
Filed Sept. 3, 1969, Ser. No. 854,988
Claims priority, application Germany, Mar. 15, 1969, P 19 13 215.1
Int. Cl. B21j 13/02, 13/14
U.S. Cl. 72—341 4 Claims



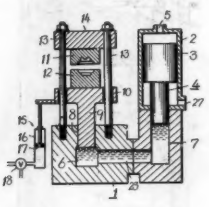
In cold moulding or pressing of workpieces, in particular workpieces of elongated form having a longitudinally applied moulding pressure, rough workpieces or blanks vary in volume and there is provided means for shearing off an unwanted overlength portion of the workpiece before the final moulding to avoid faulty deformed mouldings. Preferably, the blank is formed into a roughly moulded workpiece in a first die, the workpiece is transferred to a second die and moulded to its final basic shape and then trimmed by a shearing device, formed by a movable portion of the die and containing the over-length portion of the workpiece, displacing with respect to the main portion of the die. The workpiece can then be transferred to a third die for final moulding to the finally required form, the correct volume of material for the finally required form being supplied by the workpiece leaving the second die.

3,651,684
WORKPIECE CONVEYER DEVICE FOR A PRESS
Rudolf Liebergeld, Gernotstrasse 51/55, Nurnberg, Germany
Filed Sept. 4, 1970, Ser. No. 69,606
Claims priority, application Germany, Sept. 5, 1969, P 19 45 009.0
Int. Cl. B21d 45/00
U.S. Cl. 72—345 12 Claims



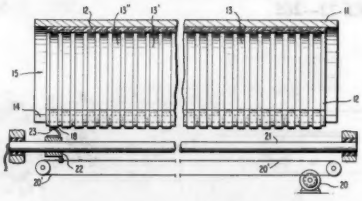
A conveyor device for long workpieces falling vertically from a press and comprising an open topped receiving device capable of receiving only one workpiece, a brake device adjacent to the receiving device for braking the fall of the workpiece into the receiving device, a track for the workpieces, means for moving the receiving device towards the track, a lifting device adjacent to the track whereby a workpiece can be displaced from the receiving device along the track, and a mechanism operatively associated with the working cycle of the press incorporating a first switch operated when the receiving device is located in the receiving position and a further switch which is operated when a workpiece is located in the receiving device.

3,651,685
HIGH HYDRAULIC PRESSURE FORGING DEVICE
Hiroshi Tominaga, Kanagawa-ken, Japan, assignor to Tokyu Sharyo Seizo Kabushiki Kaisha, Kanagawa-ken, Japan
Filed Jan. 21, 1969, Ser. No. 794,473
Claims priority, application Japan, Jan. 30, 1968, Jan. 31, 1968, Mar. 15, 1968; 43/5543, 43/5597, 43/17020
Int. Cl. B21j 7/28
U.S. Cl. 72—402 6 Claims



A high hydraulic pressure forging apparatus wherein the accelerative operation of a hammer means in a cylinder causes said hammer means to strike a liquid received within a liquid chamber, to in turn provide operating force to a plunger in operative engagement with the liquid for the displacement of a movable die mounted on the plunger in opposition to a fixed die.

3,651,686
PROGRAMABLE READOUT FOR DELTA T BAR SPECTROMETER
Steven F. Dizio, Troy, N.Y., assignor to Aero Vac
Filed Mar. 27, 1970, Ser. No. 23,277
Int. Cl. G01n 25/14
U.S. Cl. 73—25 13 Claims



A delta T bar spectrometer, for concentration of trace quantities of a gas in a mixture as the mixture is transported along a thermal gradient tube from a warm end to a cold end, produces an enrichment sufficient for measurement by separately depositing condensed gas portions according to temperatures along the delta T bar. Removal of the concentrated gas portions according to temperature involves selectively warming portions of the delta T bar in succession beginning at the low temperature end. Zones of deposition are made sharp at the temperature at which the particular constituent first condenses, to thereby separate constituents

from each other along the length of the bar. Evaporation of the condensates in succession occurs as the successive portions are warmed in an arrangement in which the delta T bar is not warmed but only segmented portions of the surface on which the condensate lies are warmed incrementally, in partial isolation from the temperature of the bar itself by the use of insulating material separating the bar from thermally conducting strips exposed to the gas mixture. A partially insulated ring so formed remains in conformity with the temperature of the bar itself during deposition. In the evaporation stage each segment or ring element is warmed through a range of only a few degrees. The quantity of heat required for this purpose is made very small. A very rapid readout of the quantities of gas constituents is achieved by sending an incremental temperature rise wave along the tube from the cold end to the hot end, without materially disturbing the overall temperature of the delta T bar and the elements return to their respective temperatures so that deposition is resumed after a brief evolution period for one or all of the deposited constituents.

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**ERRATUM**

For Class 73—37 see:
Patent No. 3,651,743

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**3,651,687**
**ULTRASONIC MICROMETER**

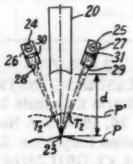
**Jacques Dory, Meaux, France, assignor to Corporation "Realisations Ultrasoniques"**

**Continuation-in-part of application Ser. No. 495,463, Oct. 13, 1965, now Patent No. 3,431,774, Continuation-in-part of application Ser. No. 508,348, Nov. 17, 1965, now Patent No. 3,423,992, Continuation-in-part of application Ser. No. 678,929, Oct. 30, 1967, now Patent No. 3,454,922. This application July 9, 1968, Ser. No. 743,415**

**Claims priority, application France, July 10, 1967, 113738**

**Int. Cl. G01n** *29/00*

**U.S. Cl. 73—67.8 R** **3 Claims**




The invention generally relates to the method of measurement of distances through reflexion of ultrasonic pulses on a reflecting surface and determination of the time interval of propogation of the resulting echoes from the reflecting surface to the transducer.

The instant invention more particularly discloses a micro method based on said method and including means for focusing the ultrasonic pulsed ways at an accurately predetermined point on the reflecting surface.

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**3,651,688**
**VIBRATION FORCE EXCITING METHOD AND APPARATUS**

**Akio Hizume; Shuji Ohyagi, and Shigeho Tanaka, all of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan**

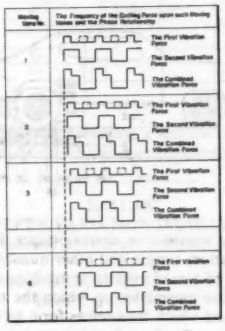
**Filed May 22, 1970, Ser. No. 39,906**

**Claims priority, application Japan, May 24, 1969, 44/40333**

**Int. Cl. G01m** *7/00*; **B06b** *1/06*

**U.S. Cl. 73—71.5** **4 Claims**

A machine rotor, having projecting members extending radially from its periphery, such as the vaned rotor of a turbine, is subjected, while remaining stationary, to the vibration sources which would act upon the vanes during actual rotation of the rotor. In the testing, a first vibration force, having a number of vibrations equal to the product of the design r.p.m. of the rotor and the number of vibration exciting sources acting thereon during rotation, is produced. A second vibration force having a number of vibrations equal to the design r.p.m. of the rotor is also produced. The first vibration force is superposed on the second vibration source during only that period in which the second vibration is normally produced. The resultant of the superposed vibration




forces is applied sequentially to successively adjacent projecting members of the stationary rotor at a phase difference equal to the reciprocal of the product of the r.p.m. and the number of projecting members or vanes. The apparatus includes successively triggered flip-flop circuits each effective to apply an exciting potential to a piezo-electric vibrating member mounted on a respective vane. Gating means are associated with the flip-flops in a manner such that the width of the pulses applied to the vibrating elements simulate the widths of the vibrating pulses actually present during operation of the rotor.

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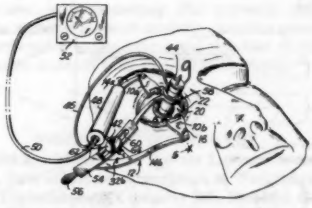
**3,651,689**
**TONOMETER MOUNTING DEVICE**

**Heskel M. Haddad, 1200 Fifth Avenue, New York, N.Y.**

**Filed Apr. 29, 1970, Ser. No. 33,026**

**Int. Cl. A61b** *3/16*

**U.S. Cl. 73—80** **10 Claims**



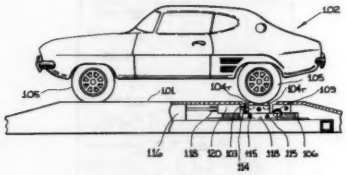

A device which is to be used with a tonometer for facilitating the operation thereof. The device includes a pair of retractors for respectively retracting the upper and lower eyelids of an eye which is to be examined. A holding unit holds and carries the pair of retractors in a position where they conveniently pull the eyelids apart from each other with a regulated force. A supporting device is provided for supporting a tonometer in a convenient position of operation while the eyelids are held back by the retractors.

3,651,690

## APPARATUS FOR MEASURING OUTPUT CHARACTERISTICS OF A ROTARY MOVING PART

Brian Colin Pagdin, Sutton Coldfield, and Brian Michael Forster, Harthill, Near Sheffield, both of England, assignors to G.K.N. Birfield Transmissions Limited, Birmingham, England

Filed Aug. 4, 1969, Ser. No. 847,298
Claims priority, application Great Britain, Aug. 2, 1968, 36,905/68
Int. Cl. G01m *15/00*
U.S. Cl. 73—117 13 Claims



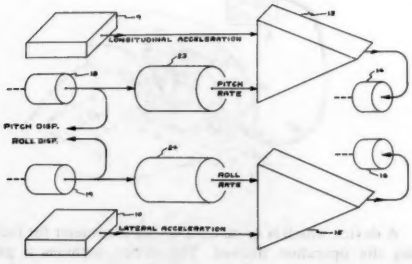
The invention provides a dynamometer for measuring velocity, acceleration, torque and other quantities relative to the performance of a road vehicle or machine and comprises a plurality of roller assemblies on which the road wheels of the vehicle rest and which themselves form an inertia load or are connected to a flywheel forming an inertia load, each roller assembly driving a pulse generator producing a train of primary pulses which are gated with longer master control pulses to provide successive groups of primary pulses of the order of 0.1 seconds duration. Successive groups are operated upon by arithmetical circuits of an electrical computer to derive output signals representing velocity, acceleration or such other quantity as may be required to be determined, this or these quantities being stored in storage circuits which are constantly updated but can be held or frozen at a particular value by a trigger signal generated in response to attainment of a predetermined value of one of said quantities such as maximum value. The quantities are displayed digitally or graphically on a cartesian plotter unit.

3,651,691

## PENDULOUS TYPE INERTIAL REFERENCE DEVICES

Donald J. Pliha, 225 South Hamel Drive, Beverly Hills, Calif.

Filed Jan. 5, 1970, Ser. No. 675
Int. Cl. G01c *21/00*
U.S. Cl. 73—178 R 5 Claims



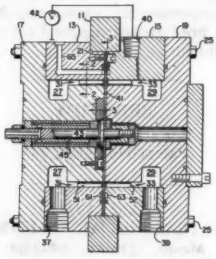

A non-gyroscopic inertial data reference device for aircraft capable of developing pitch angle, roll angle, lateral and longitudinal acceleration information and comprising a gravity-responsive pendulum device compensated for the effects of horizontal acceleration by the use of one or more accelerometers mounted on and free to move with the universally suspended pendulum, said accelerometers providing correction signals to suitable pendulum position torquers that assist in maintaining the pendulum in the true vertical position at all times.

3,651,692

## LINEAR FLUID FLOW RESISTANCE ELEMENT

Philip F. Meyfarth, c/o Alar Products, Inc. 7016 Euclid Avenue, Arlington, Mass.

Filed Jan. 12, 1970, Ser. No. 2,320
Int. Cl. G01f *1/00*
U.S. Cl. 73—205 L 9 Claims



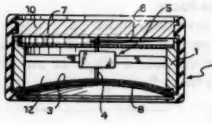
In the apparatus disclosed herein, a plurality of fluid flow channels are sequentially blocked and opened so that the fluid flowing through each channel is alternately accelerated and decelerated. As the acceleration is determined substantially by the pressure across each channel and the mass of the fluid within the respective channel, the mass flow rate and the pressure drop across the apparatus are substantially linearly related and are substantially independent of the density of the fluid.

3,651,693

## DEPTH-MEASURING INSTRUMENT

Carlo Alinari, Corso Vittorio Emanuele 200, Turin, Italy

Filed Mar. 20, 1970, Ser. No. 21,329
Claims priority, application Italy, Mar. 22, 1969, 51062 A/69
Int. Cl. G01f *23/14*
U.S. Cl. 73—300 3 Claims



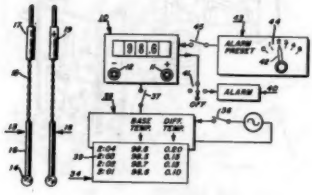
A depth-measuring instrument of the membrane type has a metallic disc membrane deformations of which are recorded by a pointer on a scale. The disc is flat and is freely supported at its edge on a seat on which it is movable when it flexes, and is covered by a flexible wall of an outer case so that ambient pressure is transmitted to the disc through this wall.

3,651,694

## DIAGNOSTIC MEANS FOR DETECTION OF DISEASES EXHIBITING SKIN TEMPERATURE VARIATIONS

Anthony H. Lamb, 66 King Street, Hillside, N.J.

Filed Sept. 18, 1969, Ser. No. 859,126
Int. Cl. G01k 3/08; A61b 5/00
U.S. Cl. 73—342 8 Claims



Temperature-sensitive probes, placed in contact with selected areas of the human body, actuate a digital temperature computer-indicator for the measurement of the base and differential temperatures of the contacted areas.

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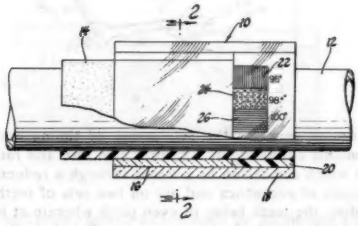
3,651,695

## COLORIMETRIC TEMPERATURE SENSOR

Verne R. Brown, Ann Arbor, Mich., assignor to Environmental Metrology Corporation, Ann Arbor, Mich.

Filed Apr. 24, 1970, Ser. No. 31,483
Int. Cl. G01k 11/16
U.S. Cl. 73—356 4 Claims



A chromatic temperature indicator for fluid conduits including a black background layer on the conduit, a colorimetric layer of cholesteric material on the background, a nonpermeable plastic tube heat shrunk over the cholesteric layer and a color reference chart adjacent the cholesteric layer for indicating the color variations thereof and the temperatures corresponding to such variations.

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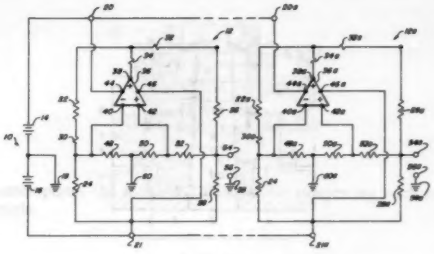
3,651,696

## LINEARIZED RESISTANCE BRIDGE CIRCUIT OPERABLE IN PLURALITY FROM A COMMON POWER SUPPLY

Robert C. Rose, Minneapolis, Minn., assignor to Rosemount Engineering Company, Eden Prairie, Minn.

Filed July 15, 1969, Ser. No. 841,906
Int. Cl. G01k 7/20
U.S. Cl. 73—362 AR 9 Claims

A bridge circuit suitable for platinum resistance thermometers having three lead wires. An operational amplifier varies the bridge excitation current in response to the bridge output to effect a desired degree of linearization or curve shaping between the sensing resistance and bridge output. The output is referenced to ground and a plurality of such bridges may be operated from a common power supply having a ground tap thus providing a flexible measuring system suitable for multipoint, continuous or scanning operations.



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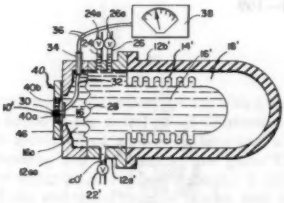
3,651,697

## DEPTH VARIATION INDICATOR

Anthony Pete Innuzzi, 1908 Old Frederick Road, Catonsville, Md.

Filed Feb. 20, 1970, Ser. No. 13,142
Int. Cl. G01l 7/02, 7/06
U.S. Cl. 73—412 11 Claims



An instrument used, for example, in measuring variations in the depth of a submersible vehicle includes a chamber which is pressurized to a reference pressure by opening a valve at a reference depth to permit the chamber to fill with sea water. The chamber is bounded by a high volume expansion member in the form of a bellows and a high sensitivity pressure sensing element such as a diaphragm, the sensing element being exposed to the ambient surroundings, that is, the sea water and measuring the pressure differential between the ambient pressure and the chamber pressure. An indicator responsive to the differential provides an indication of the variation in depth from the reference depth.

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3,651,698

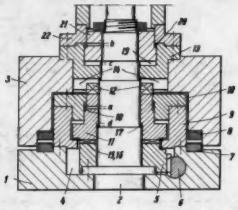
## INDEXIBLE TOOL TURRET

Alfred Riedrich, Bielefeld, and Werner Latten, Theesen Kreis, Bielefeld, both of Germany, assignors to Werkzeugmaschinenfabrik Gildemeister & Company AG, Bielefeld, Germany

Filed June 19, 1970, Ser. No. 47,804
Claims priority, application Germany, June 21, 1969, P 19 31 592.5
Int. Cl. B23b 29/32
U.S. Cl. 74—818 5 Claims

A machine tool wherein the tool turret is indexible about a shaft and is shiftable axially to move the teeth of a ring gear thereon into and out of mesh with the teeth of a stationary ring gear. The indexing mechanism for the tool turret has a pinion which is coaxial with the turret and can be connected thereto by means of a disengageable clutch. The pinion is in

permanent mesh with a reciprocable fluid-operated rack. When the clutch is engaged and the ring gears are disconnected, the rack can index the turret by way of the pinion



and clutch. When the clutch is disengaged, the rack can return to its starting position without indexing of the turret because the pinion is free to rotate with reference to the turret.

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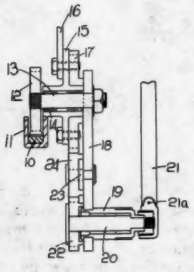
**3,651,699**

**VEHICLE WINDSCREEN WIPING MECHANISMS**

**David Thomas, Solihull, and James Barry Seager, both of Birmingham, England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England**

**Filed Oct. 28, 1969, Ser. No. 871,878**
**Claims priority, application Great Britain, Dec. 13, 1968, 59,423/68**
**Int. Cl. F16h *21/44***
**U.S. Cl. 74—109** **2 Claims**



A mechanism for controlling the operating cycle of a wiper blade for cleaning a vehicle window comprises an arm rotatably mounted on a drive member whereby it can be reciprocated, a wiper blade carrier pivotally mounted at the outer end of the arm and means for rotating the blade carrier relatively to the arm as the arm is rotated, so that a blade on the blade carrier follows an elliptical path to sweep a large area of glass.

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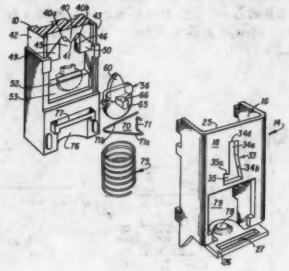
**3,651,700**

**PUSH BUTTON MEANS**

**James R. Bailey, Chicago, Ill., assignor to Switchcraft, Inc., Chicago, Ill.**

**Filed June 22, 1970, Ser. No. 48,134**
**Int. Cl. F16h *21/44***
**U.S. Cl. 74—107** **2 Claims**

A construction is provided wherein a push-push button unit useful for operating electric switches as an example is provided. This push-push means has the property of being able to be ganged with similar push-push units to provide a multi-push button construction wherein each push button may be independently pushed to lock and again pushed to release, and in addition, is provided with a separate release



button for unlocking all pushbuttons in the ganged construction which have previously been locked.

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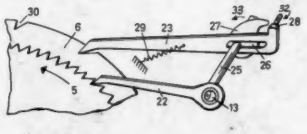
**3,651,701**

**TIMING GEAR**

**Walter Holzer, and Konrad Laufer, both of Meersburg, Germany, assignors to Holzer-Patent AG, Zug, Switzerland**

**Filed Sept. 15, 1969, Ser. No. 857,702**
**Int. Cl. F16h *31/00***
**U.S. Cl. 74—143** **3 Claims**



A timing gear for the production of timing and switch movements consisting of a control cam disc and ratchets or pawls which are driven by a motor through a reduction gear by means of eccentrics and act on two sets of teeth on the cam disc, the teeth being of even pitch wherein at least two pawls are provided which engage a set of teeth on the control cam disc and are given differing strokes.

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**3,651,702**

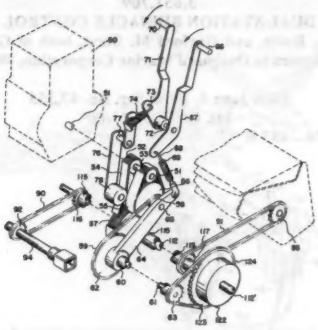
**DRIVE MECHANISM**

**Ralph W. Speiser, Minneapolis, Minn., assignor to Toro Manufacturing Corporation, Minneapolis, Minn.**

**Original application Aug. 19, 1964, Ser. No. 390,704, now Patent No. 3,410,063. Divided and this application Oct. 17, 1968, Ser. No. 785,422**
**Int. Cl. F16h *15/00***
**U.S. Cl. 74—203** **7 Claims**

Drive mechanism for a riding mower in which the power for driving the traction wheels of the vehicle and for driving the cutting units is transmitted from a common engine shaft. The power to the wheels is transmitted through a reversible transmission involving a coplanar driving and driven pulleys rotating on parallel axes and movable into and out of engagement with each other and drivingly interconnected by a belt wrapped around both pulleys. When the pulleys are engaged with each other, the belt is slack, and the driven pulley is driven in one direction. When the pulleys are disengaged, the belt is tightened and drives the driven pulley in the opposite direction. The power to the cutting units is transmitted from

the engine through an intermediate shaft which is rotatably mounted on the wheel axle. At least two of the cutting units



are in alignment and driven by a common coaxial drive shaft driven from said intermediate shaft.

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**3,651,703**

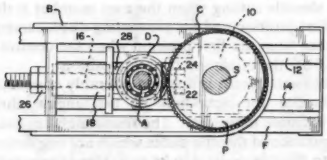
**BELT AND PULLEY POWER TRANSMISSION**

**Andrew T. Kornylak, 400 Heaton Street, Hamilton, Ohio**

**Filed July 22, 1970, Ser. No. 57,062**

**Int. Cl. F16h** *7/02*

**U.S. Cl. 74—229** **14 Claims**



A belt and pulley power transmission for producing a more positive drive than that which can be obtained by smooth friction surfaces between belt and pulley. The pulley is roughened or provided with a coating or sleeve of flexible material and loops of beaded chains are positioned between the belt and pulley. The beads become indented in the flexible belt and embedded in the surface of the pulley to increase the tractive effort which can be transmitted over that of the customary smooth faces of pulley and belt. A guiding drum or bar guides the loops for travel in parallel planes and permits easy lateral adjustment of the belt.

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**3,651,704**

**MOLDED ARTICLE, MOLD AND METHOD OF MANUFACTURE**

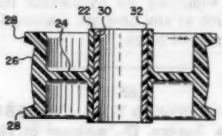
**Robert Dean Chapman, Des Plaines, and Swick Edwin Grant, Bartlett, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.**

**Original application Mar. 4, 1968, Ser. No. 710,114, now abandoned. Divided and this application May 1, 1970, Ser. No. 43,658**

**Int. Cl. F16h** *55/36, 55/12*

**U.S. Cl. 74—230.01** **4 Claims**

An article of manufacture normally having a secondary member necessary for its function insert molded in place and having warning means which renders the article inoperative when said secondary member is absent. The invention also



contemplates the mold and method for fabricating such an article.

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**3,651,705**

**GEARS FOR TOOTHED BELT DRIVES, PARTICULARLY FOR MOTORS FOR AUTOMOTIVE VEHICLES, MADE OF SYNTHETIC MATERIAL**

**Emilio Alberto Bertinetti, and Aurelio Lampredi, both of Turin, Italy, assignors to Fiat S.p.A. and Cigala & Bertinetti S.a.S., Turin, Italy**

**Filed Oct. 14, 1970, Ser. No. 80,729**

**Int. Cl. F16h** *55/30, 55/12*

**U.S. Cl. 74—243 R** **2 Claims**

A synthetic plastic gear adapted for use with a toothed belt drive such as found in the motor of an automotive vehicle is provided with a co-molded central bushing and a web connecting the bushing and the teeth of the gear. The web is formed in two different and parallel planes. A skirt, in the form of a radially extending circular flange, may be formed on one face of the gear.

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**3,651,706**

**LEAD SCREW DEVICE**

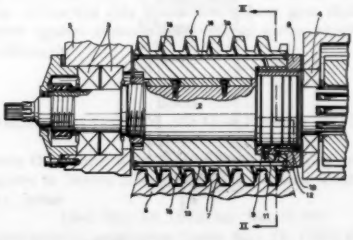
**Maso Galbarini, Pavia, and Francesco Cotta Ramusino, Milan, both of Italy, assignors to Innocenti Societe Generale L'Industria Metallurgica E Meccanica, Milan, Italy**

**Filed Apr. 16, 1970, Ser. No. 29,205**

**Claims priority, application Italy, Apr. 17, 1969, 51468 A/69**

**Int. Cl. F16h** *57/00, 1/18, 57/04*

**U.S. Cl. 74—410** **1 Claim**



A device having a lead screw and a grooved block the grooves of which form a threaded portion for cooperation with the thread of the lead screw. The lead screw has internal passages with outlets at the thread faces for supplying a

hydrostatic support fluid, such as a lubricating oil, to the interface between cooperating threads. The side walls of the grooves have recesses into which the hydrostatic support fluid can flow from the said passageways. A distributor valve is provided for supplying the hydrostatic fluid only to the passageways which at any time are communicating with the recesses in the grooved block.

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**3,651,707**

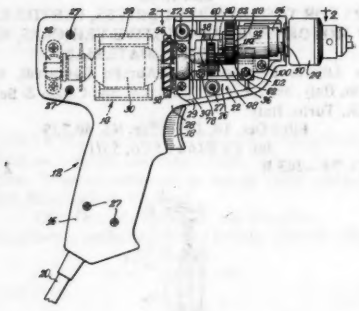
**PORTABLE POWER TOOL CONSTRUCTION**

**Spencer C. Rees, Aurora, Ill., assignor to Thor Power Tool Company, Aurora, Ill.**

**Filed July 22, 1970, Ser. No. 57,275**

**Int. Cl. F16h** *1/20;* **F16c** *35/00;* **H02k** *7/14*

**U.S. Cl. 74—421 A** **12 Claims**



A portable power tool including a motor, a drive train, and a bearing block for the drive train, all mounted in a split outer housing. The motor and drive train have bearings mounted in the bearing block which is made from a material which has high strength and which is a good heat sink. The outer housing is made from an electrical insulating material for double insulation. The outer housing is split and the axes of various shafts are offset.

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**3,651,708**

**GEAR HAVING A DETACHABLE PLASTIC RIM**

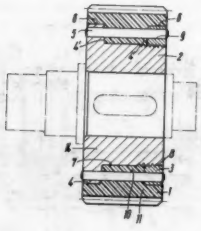
**Friedrich Muller, Halstenbek, Germany, assignor to Aristo-Werke Dennert & Pape KG, Hamburg, Germany**

**Filed Sept. 14, 1970, Ser. No. 72,011**

**Claims priority, application Germany, May 2, 1970, P 20 21 685.7**

**Int. Cl. F16h** *55/12*

**U.S. Cl. 74—447** **7 Claims**



A gear with a metallic core and a peripheral member of synthetic material connected to said core, in which said metallic core has a substantially H-shaped diametric section the legs of which are engaging inwardly extending radial portions of said peripheral member, while axis-parallel pins extend through said core and said peripheral member, one of said legs being adjustable.

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**3,651,709**

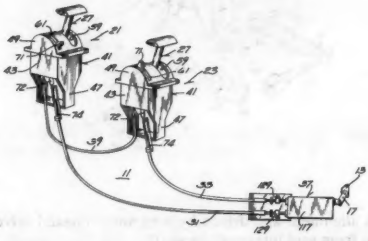
**DUAL STATION BINNACLE CONTROL**

**Robert A. Booty, and Gaylord M. Borst, both of Galesburg, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.**

**Filed June 4, 1970, Ser. No. 43,355**

**Int. Cl. G05g** *11/00*

**U.S. Cl. 74—483 R** **6 Claims**



The invention provides a dual station marine propulsion control system including means selectively operable to afford control of an engine throttle and/or clutch at one station while preventing the exercise of control from the other station and vice versa. Each throttle control station comprises a control lever movably mounted relative to a minimum throttle setting, a cam member movably mounted relative to a first position, and means movably mounted on the housing and coacting with said cam member and with cooperating means on the lever for preventing movement of the lever from the minimum throttle setting when the cam member is displaced from the first position and for preventing displacement of the cam member from the first position when the control lever is displaced from the minimum throttle position.

Also disclosed herein is a frame operably connected to an engine throttle for actuation of the engine throttle in response to frame movement. The frame includes guide paths for first and second throttle slides which are respectively connectable to throttle control links or cables connected respectively to remote control stations so as to effect throttle slide movement in response to throttle control link movement. Also included are means on the frame and on the throttle slides for alternatively and selectively connecting one of the throttle slides to the frame for common movement of the frame with the one throttle slide and for permitting relative movement between the other of the throttle slides and the frame.

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**3,651,710**

**VARIABLE RADIUS CRANK ARM FOR TYPEWRITER IMPRESSION CONTROL**

**George Burkett, Monroe County, and Thurston H. Toeppen, Dutchess County, both of N.Y., assignors to The Singer Company**

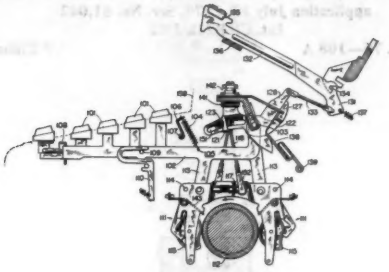
**Filed Jan. 29, 1970, Ser. No. 6,875**

**Int. Cl. G05g** *1/04;* **B41j** *23/08*

**U.S. Cl. 74—522** **5 Claims**

A variable radius crank arm which is selectively adjustable is disclosed in a typewriter setting and used to exert an influence on the flight of the typebar towards the print impression position for the purpose of controlling the velocity of the typebar at impact and hence the quality of the printed impression. The crank arms is provided with a selectively positionable clip which is retained in the selected position by appropriate detenting. The compactness of the design combined with the ease of accessibility for the purpose of adjust-

ing the clip to the selected position is a feature of the invention. Another feature resides in the fact that the clip on the variable radius crank arm may be selectively positioned to



any desired position without introducing undesired or detrimental effects in the positioning or placement of any other parts. This last feature is achieved by positioning the clip in an arcuate slot.

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**3,651,711**

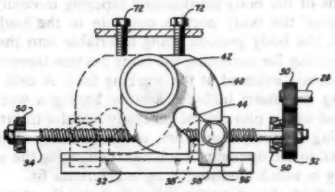
**SHAFT ROTATING DEVICE**

**Marvin H. Greenwood; Lomis Slaughter, Jr., and George N. Polydoros, all of Houston, Tex., assignors to Anderson, Greenwood & Co., Bellaire, Tex.**

**Filed Apr. 16, 1970, Ser. No. 29,081**

**Int. Cl. F16h** *35/00*

**U.S. Cl. 74—625** **14 Claims**



A shaft rotating device suitable for rotating valve shafts which device includes an arm to be secured to the shaft, the arm defining a slot which diverges at its outer end, a screw driven nut having a projection engaging in the arm slot so that upon movement of the nut, the arm is rotated. The device includes a motor drive, a belt, a mechanical fuse clutch transmission, a tension adjustment for the belt, a clutching handwheel connected so that the handwheel may override the motor drive and stop switches in an explosion proof portion of the housing actuated from the oil bath portion of the housing in which the screw, nut and other elements are housed.

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**3,651,712**

**MOBILE DRIVE MECHANISM**

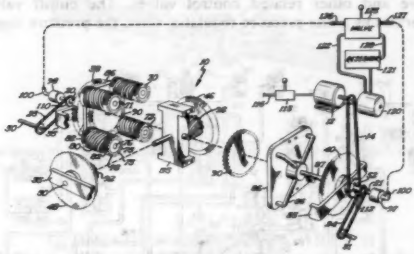
**John L. Davis, 3228 Pillsbury Avenue South, Minneapolis, Minn.**

**Filed Sept. 11, 1970, Ser. No. 71,507**

**Int. Cl. F16h** *47/04, 37/06, 1/38*

**U.S. Cl. 74—687** **19 Claims**

A differential gearing mechanism providing an improved mobile drive and steering mechanism for vehicles which are steered by a difference in rotation imparted to drive shafts on each side of a vehicle. The differential gearing mechanism utilizes a standard differential gearing with a drive motor connected to the gear case. A control motor associated with the gear case or one of the output shafts and rotatable therewith drives through control gears to the idler gears of the differential gearing mechanism to impart rotation to the



driven gears of the differential with reversible rotation at variable speeds to vary the rotation of the output shafts connected thereto.

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**3,651,713**

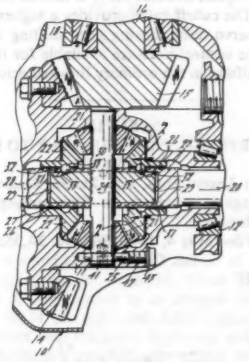
**LOCKS FOR SECURING AXLES TO A DIFFERENTIAL**

**Otto Mueller, 13 Byfield Lane, Dearborn, Mich.**

**Filed May 1, 1970, Ser. No. 33,843**

**Int. Cl. F16h** *1/40*

**U.S. Cl. 74—713** **10 Claims**



The axle lock is formed by a cam plug and a set of balls mounted within an axially disposed recess at the inner end of the axles which are supported in driving relation within the side gears of the differential. The rotation of the pinion gear shaft moves the cam plugs further into the recesses and the balls outwardly into locking engagement within an annular recess within the side gears. The pinion gear shaft is then secured against rotation by a pin or screw which extends therethrough.

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**3,651,714**

**HYDRAULIC CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION**

**Minoru Ohya, and Keiji Kogaki, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan**

**Filed May 18, 1970, Ser. No. 38,169**

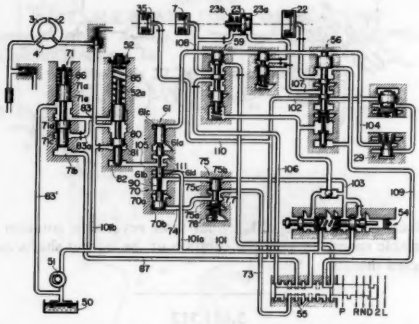
**Claims priority, application Japan, May 21, 1969, 44/38792**

**Int. Cl. B60k** *21/00, 29/00*

**U.S. Cl. 74—867** **9 Claims**

A hydraulic control system is provided for an automatic automotive vehicle transmission of the type including a gear changing unit, such as a planetary gear unit, having brakes

and clutches controlled by hydraulically operated servo units, and including hydraulic torque transmitting means, such as a torque converter, coupling the gear changing unit to the vehicle engine. The hydraulic control system includes a cutoff valve hydraulically associated with a pressure regulator valve and other related control valves. The cutoff valve operates as a line pressure regulator when the pressure regulator valve is rendered ineffective in set positions of a manual speed selector valve. In particular, the cutoff valve becomes effective, with the pressure regulator valve becoming ineffective, when the speed selector valve is moved into the "reverse" position. The cutoff valve provides a higher control pressure for the servo units, during gear shifting in the reverse range, than the control pressure available for the servo units during gear shifting in the ordinary forward driving range.



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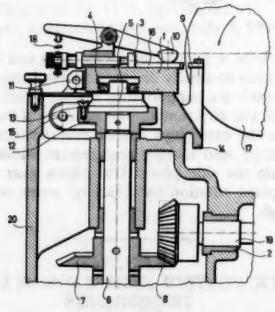
## 3,651,715
## SAW SHARPENER, PARTICULARLY TO SHARPEN JUMP SAWS

**Andras Pecze; Laszlo Suto, and Zoltan Banoczi, all of Budapest, Hungary, assignors to Szerszamgepipari Muvek, Budapest, Hungary**

**Filed May 4, 1970, Ser. No. 34,355**
**Int. Cl. B23d** *63/12*
**U.S. Cl. 76—37** **3 Claims**

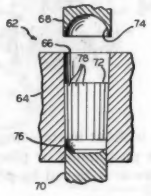


A work holder has intermittent work feed along a path which is a series of semicircles. A work table oscillates bodily continuously about a vertical axis but the work is restrained during half of each revolution, at which time the work table slides under the restrained workpiece. To sharpen saw blades, the blade is disposed parallel to the axis of a grinding wheel and the diameter of the circle of oscillation is equal to the pitch of the saw teeth.

## 3,651,716
## MANUFACTURE OF INSERT FOR DRILL BIT

**Frank E. Stebley, 3815 Nemesis Avenue, Gurnee, Ill.**

**Original application May 8, 1969, Ser. No. 822,883, now Patent No. 3,581,835, dated June 1, 1971. Divided and this application July 13, 1970, Ser. No. 61,042**
**Int. Cl. B21k** *5/02*
**U.S. Cl. 76—108 A** **9 Claims**



A solid wear-resistant sintered metallic carbide insert adapted for forcible insertion into an opening in a working face of a drill bit includes a generally polygonal body portion having at least about 12 sides extending between opposite ends thereof, and a head portion on one end of the body portion, the corners formed by the said sides being abraded at the ends of the body portion and tapering inwardly towards the end of the body portion opposite to the said one end thereof, the body portion being insertable into the working face opening for mounting the body portion therein with the head portion exposed at the working face. A drill bit incorporating the insert includes a body having a working face provided with a plurality of generally circular insert openings extending inwardly therefrom, and a plurality of the inserts mounted in the openings, each insert engaging the wall of the opening in which mounted in an interference fit.

A method of making the insert includes the steps of molding metallic carbide powder under die pressure to form a molded article including a generally polygonal body portion having at least about 12 sides extending between opposite ends thereof and a head portion on one end of the body portion, the body portion tapering inwardly towards the end thereof opposite to the said one end, sintering the molded article to form a sintered article having concave sides, and abrading the sintered article whereby the corners formed by the sides are abraded at the ends of the body portion and are tapered inwardly towards said opposite end of the body portion, thereby producing an insert having the body portion insertable into the working face opening for mounting the body portion therein with the head portion exposed at the working face.

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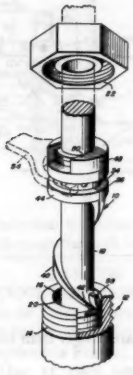
## 3,651,717
## PACKING EXTRACTOR

**William P. Johnston, Jr., El Dorado, Ark., assignor to David R. Rumsey, El Dorado, Ark., a part interest**

**Filed Sept. 23, 1970, Ser. No. 74,718**
**Int. Cl. B25b** *27/00*
**U.S. Cl. 81—8.1** **7 Claims**

An opened helix is attached at a first end thereof to a coupling that is concentrically mounted on a shaft encircled at a point along its length with packing material. The op-

posite end of the helix is adapted to pry into a slit formed in the packing material. As the helix is rotated, the packing



material is extracted. A wrench or similar tool is used to produce rotation of the helix.

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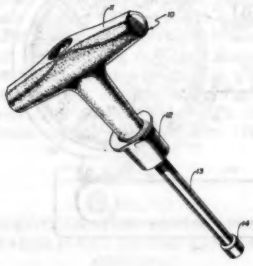
**3,651,718**
**WRENCH**
**Harvey A. Thomasian, Northboro, Mass., assignor to Lowell Corporation, Worcester, Mass.**
**Continuation of application Ser. No. 799,458, Feb. 14, 1969, now abandoned. This application Nov. 13, 1970, Ser. No. 89,503**
**Int. Cl. B25b** *13/00*,
**U.S. Cl. 81—52.4** **6 Claims**



In general, this invention relates to a limited-torque ratchet wrench and, more particularly, to such a wrench having means for selectively nullifying the ratcheting effect.

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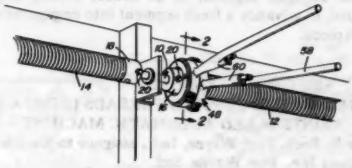
**3,651,719**
**OVERHEAD DOOR TORSION SPRING ADJUSTING TOOL**
**Alfred H. Wessel, 103 East Jefferson, El Paso, Ill.**
**Filed Dec. 31, 1969, Ser. No. 889,390**
**Int. Cl. B25b** *13/46*
**U.S. Cl. 81—63.2** **3 Claims**

A split sleeve clamp member for removable securement about and keying to a rotatable sleeve anchor for a torsion spring. The clamp member includes outer ratchet teeth and a pair of lever members are removably journaled from the clamp member and include reversible spring-urged detent members engaged with the teeth on the clamp member for rotating the sleeve clamp member, and thus the sleeve



anchor, in a preselected direction in response to oscillation of the lever members.

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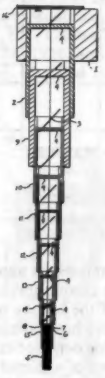
**3,651,720**
**AUTOMATIC SOCKET SCREW WRENCH**
**Edward F. Indyk, 2707 Wareing Drive, Lake Orion, Mich.**
**Filed Oct. 1, 1969, Ser. No. 862,749**
**Int. Cl. B25b** *13/06*
**U.S. Cl. 81—121 R** **1 Claim**



A wrench assembly including a series of axially overlapping telescoping wrench segments which are maintained axially relative to one another by an integral spiral spring interconnecting all of the segments. Each segment has a substantially constant wall thickness from one end to the other end with diametrically opposed tabs struck out of the side walls and extending toward one another, about which the spring is spiraled.

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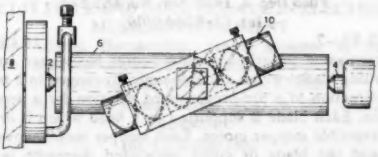
**3,651,721**
**TURNING APPARATUS**
**Shaul Ladany, 71 Rechov Aluf David, Ramat Gan, Israel**
**Filed May 15, 1970, Ser. No. 37,816**
**Int. Cl. B23b** *1/00*
**U.S. Cl. 82—1 C** **6 Claims**



Turning apparatus comprises a turning tool having a helical cutting edge and a holder therefor to hold the tool fixed

with a segment of its helical cutting edge in engagement with the workpiece as the latter is rotated, the tool holder enabling the tool to be rotated a predetermined amount, when the engaged segment of its helical cutting edge has been worn, to advance a fresh segment into engagement with the workpiece.

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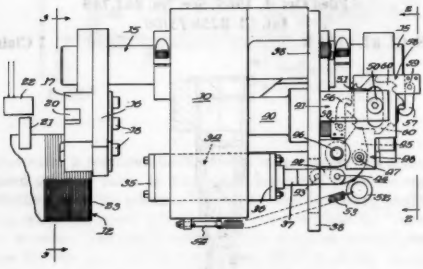
**3,651,722**

**MECHANISM FOR CUTTING THREADS USING A TAPE CONTROLLED AUTOMATIC MACHINE**

**Maurice E. Beck, Fort Wayne, Ind., assignor to Kunkle Valve Company Inc., Fort Wayne, Ind.**

**Filed Mar. 4, 1970, Ser. No. 16,405**
**Int. Cl. B23b** *5/46*
**U.S. Cl. 82—5** **8 Claims**



The invention contemplates an automatic machine of the tape controlled type for cutting threads on a rotating workpiece by a single pass of the cutting tool or by a multiple of passes. A combination ratchet and cam member is provided for projecting the tool for depth of cut and for withdrawing the tool at the completion of a thread cutting pass. The tape contains certain commands punched into the tape for controlling displacement, feed etc., and the invention provides a sensing part which rotates with the workpiece and a stationary part containing a proximity switch which is magnetically influenced by the sensing part on each revolution. When the cutting tool has been positioned close to the workpiece, the threading feed is picked up and the tool is fed forwardly for a relatively short distance and then dropped out accurately. This is a required preliminary step prior to actuation of the proximity switch the closing of which assures that the thread cutting operation will start at the same exact spot on the workpiece for all passes of the tool.

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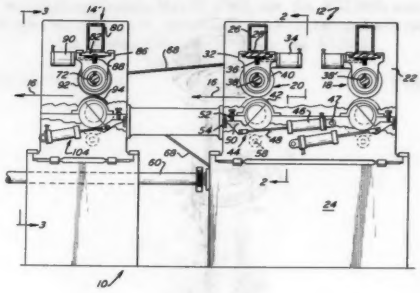
**3,651,723**

**CORRUGATED PAPERBOARD SLITTER-SCORER**

**William Gallagher, Jr., Clementon, N.J.; Edwin R. Kolb, and James E. Murray, both of University Heights, Ohio, assignors to Harris-Intertype Corporation, Cleveland, Ohio**

**Filed Dec. 4, 1969, Ser. No. 882,244**
**Int. Cl. B26d** *9/00*
**U.S. Cl. 83—7** **16 Claims**

A corrugated paperboard slitter-scorer has scorer collars and slitting blades which are automatically moved in a transverse direction to a pre-programmed position for a production run. Each blade is supported by a head which is driven by a reversible stepper motor. Each stepper motor moves its head and the blade or collar associated therewith in the desired transverse direction to a preselected position. The motors are controlled by programmed signals which drive the heads to the desired positions prior to each production run. Each of the scorer collars cooperates with an elongated roller and each of the slitter blades cooperates with an elongated brush roller. The rollers are longer than the distance between the blades.



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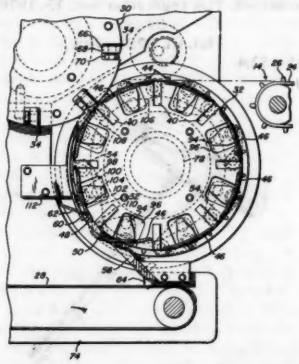
**3,651,724**

**METHOD AND APPARATUS FOR PRODUCING CARD SETS**

**Harold W. Huffman, Hamilton, Ohio, assignor to The Hamilton Tool Company, Hamilton, Ohio**

**Filed Feb. 9, 1970, Ser. No. 9,820**
**Int. Cl. B65h** *29/26*
**U.S. Cl. 83—24** **20 Claims**



The machine accepts a multilayer perforated paper web of indeterminate length from a collating machine, and rapidly cuts off, without waste, individual parcels, packets or card sets so accurately dimensioned that cards included in the sets may be used as data cards in automatic high speed data card handling equipment without supplemental sizing or finishing treatment. The register perforations of the web are used as guides to ensure accuracy of the cutoff.

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**3,651,725**

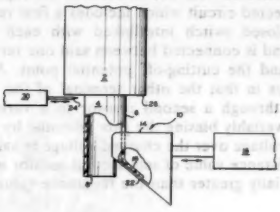
**APPARATUS AND METHOD FOR FORMING A BLOWING PIN OPENING ON A PARISON**

**Kenneth U. Cook, Copan, Okla., assignor to Phillips Petroleum Company**

**Filed Apr. 27, 1970, Ser. No. 32,179**
**Int. Cl. B29d** *23/04*
**U.S. Cl. 83—165** **6 Claims**

Movable first and second cutting elements are removably positioned in the pathway of a wall of a parison discharging

from a die of an extruder for removing a portion of the wall



of the parison at selected locations and forming a parison having an opening through the wall thereof.

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**3,651,726**

**CUTTING DEVICE FOR FIBROUS MATERIALS**

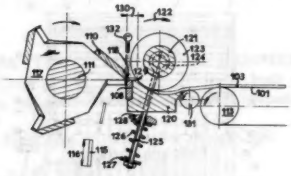
**Robert Laroche, Rue de Thizy, Cours, France**

**Filed Jan. 5, 1970, Ser. No. 725**

**Claims priority, application France, Jan. 21, 1969, 6900928; Mar. 11, 1969, 6906628**

**Int. Cl. B26d** *5/20*

**U.S. Cl. 83—169** **10 Claims**



A cutting device for fibrous materials comprises a driving device and a cutting device, said driving device including a fixed member **17** and a rotary member, said rotary member having a series of rings **19** of resilient material, such as a rubber or plastics material, said rings **19** being carried by a common shaft **18**, and being resiliently loaded towards said fixed member **17**. The driving device may either comprise a lower fixed blade **7** and an upper blade **9** with a rising and falling movement, or a lower fixed blade **108** with which there cooperates several rotating blades **110** carried by a drum **111**.

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**3,651,727**

**ELECTROPHOTOGRAPHIC DUPLICATOR IN WHICH COPY PAPER IS CUT TO THE LENGTH OF THE ORIGINAL**

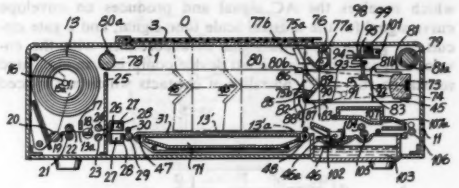
**Shigeru Suzuki; Keiji Sugita, both of Yokohama; Yutaka Koizumi, and Tadaaki Kanno, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan**

**Original application Oct. 2, 1967, Ser. No. 672,252, now Patent No. 3,533,691. Divided and this application June 11, 1970, Ser. No. 45,347**

**Int. Cl. B26d** *1/38*

**U.S. Cl. 83—296** **9 Claims**

A cutting device is provided for use in an electrophotographic duplicator so that rolled printing paper can be cut in accordance with the length of an original placed on a mounting table. To determine the length to be cut an indicator is slidably mounted along a side edge of the table so that a pointer of the indicator can be moved into alignment with one edge of the original whose other edge rests against an index on the table. The movement of the indicator rotates a plate on which is mounted a microswitch and the microswitch controls the operation of the cutting device. A cam plate is rotatable about an axis coincidental with the rotation axis of the plate carrying the microswitch, and the cam plate is rotated upon initiation of the feed of the rolled printing paper. The distance between the operation portion of the cam plate and the microswitch is determined in accordance with the length of the original, whereby the cutting device will be operated to feed a length of printing paper equal to the length of the original.



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**3,651,728**

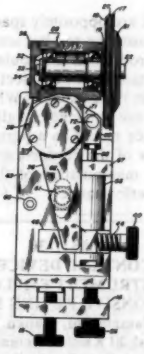
**CUTTING KNIFE FOR SLITTING METAL FOIL**

**Roger W. Young, Upper Montclair, N.J., assignor to John Dusenbery Company, Inc., Clifton, N.J.**

**Filed Apr. 28, 1970, Ser. No. 32,552**

**Int. Cl. B26d** *1/28*

**U.S. Cl. 83—474** **9 Claims**



A rotatable cutting knife for use in a machine for slitting a moving web of metal foil, the cutting knife cooperating with a driven backup knife to slit the foil by a shearing action. The cutting knife has a concave configuration and is supported by a structure affording adjustments of the cutting knife with respect to the backup knife, thereby reducing the overlaping of the knives required to shear a particular foil and minimizing the possibility of the cutting knife overriding the backup knife.

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**3,651,729**

**CIRCUIT FOR RAPID NOTE PASSAGE IN ELECTRONIC MUSICAL INSTRUMENT**

**Takeshi Adachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan**

**Filed Aug. 26, 1970, Ser. No. 67,000**

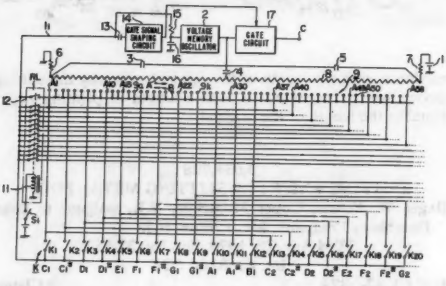
**Claims priority, application Japan, Aug. 29, 1969, 44/82057; 44/68430**

**Int. Cl. G10h** *1/02*

**U.S. Cl. 84—1.17** **2 Claims**

An electronic musical instrument-circuit for a rapid note passage (portamento or arpeggio) comprises an operational device for leading out, when manipulated, a DC signal

representing a manipulated position and an AC signal, a capacitor which is connected to be charged with the DC signal, a voltage memory oscillator capable of producing a musical scale tone signale having a frequency determined by the DC voltage at the capacitor, a gate signal shaping circuit which receives the AC signal and produces an envelope curve signal for the musical scale tone signal, and a gate circuit for gating the tone signal in accordance with the envelope signal. The operational device comprises an elongated resistance rod and a plurality of contacts which are spaced




from each other and are oppositely spaced apart at a certain distance from the resistance rod but are brought into contact with the resistance rod when manipulated. There is further provided a switch arrangement to selectively connect the plurality of contacts with the capacitor. When all of the contacts are connected with the capacitor, a gliding manipulation of the operational device results in a portamento performance, and when only a few of the contacts are connected with the capacitor, a gliding manipulation of the operational device results in arpeggio performance.

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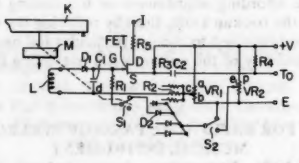
**3,651,730**

## SOUND LEVEL CONTROL DEVICE IN ELECTRONIC MUSICAL INSTRUMENT EMPLOYING TOUCH RESPONSIVE KEYING MEANS

**Takeshi Adachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan**

**Filed Sept. 8, 1970, Ser. No. 70,056**
**Claims priority, application Japan, Sept. 10, 1969, 45/23715**
**Int. Cl. G10h** *1/02*
**U.S. Cl. 84—1.24** **2 Claims**




In an electronic musical instrument of keyboard type, a sound level control device comprises a required number of coils and magnets respectively associated with the keys in the keyboard to induce a voltage in response to the key depression speed in one of the coils when a key in the keyboard is depressed, a capacitor connected across each of the coils to be charged by said induced voltage through a diode, a semiconductor switch element having a signal input electrode, a signal output electrode and a control electrode which is connected with one terminal of the capacitor, and a series-connected circuit which includes a first resistor and a normally closed switch interlinked with each key in the keyboard and is connected between said one terminal of the capacitor and the cutting-off potential point. An improvement resides in that the other terminal of the capacitor is connected through a second resistor to a variable voltage source for variably biasing the gate potential by superposing a variable voltage over the charged voltage in said capacitor, and the resistance value of said second resistor is selected to be substantially greater than the resistance value of the first resistor.

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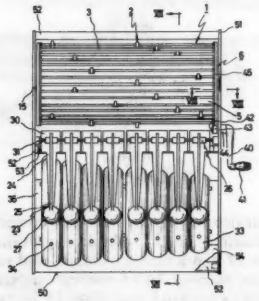
**3,651,731**

## APPARATUS FOR THE OPERATION OF TOY MUSICAL INSTRUMENTS

**Luis Congost Horta, Iradier 6 bis, Barcelona, Spain**

**Filed July 6, 1970, Ser. No. 52,194**
**Claims priority, application Spain, Dec. 22, 1969, 375.581**
**Int. Cl. G10f** *1/06;* **G10d** *13/08*
**U.S. Cl. 84—95** **10 Claims**



A toy for the reproduction of diverse musical fragments thanks to the suitable placement of striker tabs over a generally cylindrical surface, on which the striker tabs necessary for the reproduction of the chosen musical fragment acquire a fixed operation position on said cylindrical surface by placing them at the points of intersection of two line systems on said surface, while the rest of the striker tabs of the toy are in an operative position. The regular movement of the cylindrical surface by manual or electric means causes the operative striker tabs to operate some acoustical means simultaneously or in order, either directly or through percussion hammers with the result of said operation being the reproduction of the chosen musical fragment.

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**3,651,732**

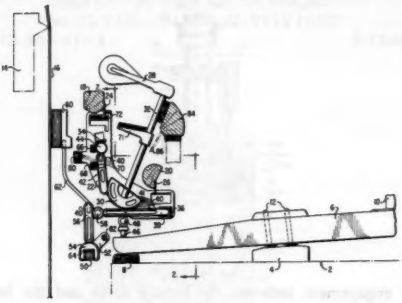
## PIANO ACTIONS

**Virgil Erbert, and Donald F. Wilkes, both of Albuquerque, N. Mex., assignors to Rolamite, Incorporated, San Francisco, Calif.**

**Filed May 18, 1970, Ser. No. 38,003**
**Int. Cl. G10c** *3/18*
**U.S. Cl. 84—240** **25 Claims**

A piano action for transmitting motion individually from a piano key to a hammer which strikes the corresponding string. The hammer is supported on a roller for swinging toward and away from the piano string. A guide bar supports the roller and a thin flexible band extending around the bar

and the roller transmits motion from the key to the roller. The hammer, roller and guide bar are mounted on an individual frame which allows the piano action foe each string



position to be installed and removed separately. The piano action also includes a toggle device which controls the operation of a backcheck and includes a damper for the string that is operated in coordination with the motion of the hammer.

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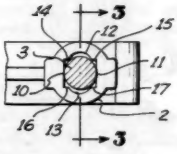
3,651,733

**HAMMER BUTT WITH ADJUSTABLE HAMMER SHANK**

Merton D. Corwin, and Walter E. Dietrich, both of Cincinnati, Ohio, assignors to D. H. Baldwin Company, Cincinnati, Ohio

Filed Aug. 31, 1970, Ser. No. 68,200
Int. Cl. G10c *3/18*
U.S. Cl. 84—243 4 Claims



A hammer butt for use in a piano action, said hammer butt preferably being molded from plastic and having an integral socket for receiving the end of a hammer shank which is circular in cross section, the opening in said socket being of a width to engage opposite sides of the hammer shank and of a length greater than the diameter of said hammer shank so that the hammer shank may be tilted relative to the socket so as to bring the hammer shank and the hammer mounted thereon into accurate alignment with the string to be struck by the hammer.

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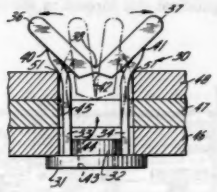
3,651,734

**EXPANSIBLE FASTENER**

Thomas W. McSherry, Medford, N.Y., assignor to Mechanical Plastics Corp., New York, N.Y.

Continuation-in-part of application Ser. No. 844,690, Apr. 23, 1969, now abandoned. This application July 10, 1969, Ser. No. 845,655
Int. Cl. F16b *13/04*
U.S. Cl. 85—80 28 Claims

A fastener having a head engageable with one end of an opening, an expandable overcenter toggle lock on the other side of said opening expandable from a collapsed position in which the fastener is insertable within an opening to an overcenter stable expanded condition to lock the fastener within



the opening, and a pair of spaced apart resilient members connecting the head and the expandable toggle lock to transmit forces to the toggle lock to maintain it in the stable overcenter position.

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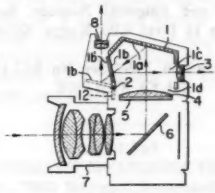
3,651,735

**VIEW-FINDER FOR SINGLE LENS REFLEX CAMERAS**

Kenji Hiruma, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed July 20, 1970, Ser. No. 56,511
Int. Cl. G03b *13/00, 19/12*
U.S. Cl. 88—1.5 R 3 Claims



Viewfinder system, for single-lens reflex cameras, which permits viewing both at eye level, and waist or chest level, and comprises a pentagonal roof-type reflecting mirror assembly (similar in function to the conventional penta-prism), whose second reflecting mirror or surface is pivotally mounted, so that it may be switched between two positions. This second reflecting surface, which may be pivoted about its center or an edge, in one position redirects the beam of light from the camera lens system toward an eye-level finder lens while in the other position it redirects the beam toward a waist or chest-level finder lens.

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3,651,736

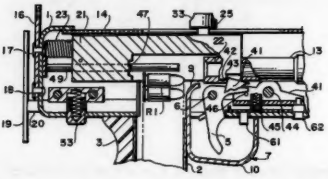
**BOLT HANDLE AND PISTOL GRIP MAGAZINE FOR AN AUTOMATIC FIREARM**

Gordon B. Ingram, Studio City, Calif., assignor to Michael H. Adair and Rosser S. Reeves, III, c/o Tiderock Corporation, New York, N.Y., attorneys-in-fact

Filed June 11, 1969, Ser. No. 832,083
Int. Cl. F41d *11/02*
U.S. Cl. 89—132 7 Claims

An automatic firearm comprises a frame, a receiver mounted on the frame, a barrel mounted on the receiver, a bolt disposed in the receiver and telescopically movable relative to the breech end of the barrel against the action of a recoil spring, the bolt being controlled by a sear which is movable in response to movement of the weapon trigger. A

trigger guard is mounted on the frame and disposed in enveloping relationship to the trigger and arranged with one end protruding inwardly of the frame and adjacent the breech end of the barrel so as to aid in guiding rounds of ammunition into the breech end of the barrel. A bolt handle is movably mounted on the bolt and arranged to extend through a longitudinal slot formed in the receiver. The bolt



handle is constructed so as to form a locking relationship with enlarged ends of the longitudinal slot when moved relative to the bolt and a sight passage is formed in the outwardly protruding portion of the bolt handle which allows sighting therethrough in line with the front and rear sights when the bolt handle is in an unlocked condition but precluding sighting when the bolt handle is in locked position.

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**3,651,737**

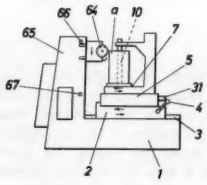
**GEAR CUTTING APPARATUS**

**Shoichi Aoyama, and Shigeichi Nomoto, both of Tokyo, Japan, assignors to Oval Kiki Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Sept. 30, 1969, Ser. No. 862,191**

**Int. Cl. B23f *9/08***

**U.S. Cl. 90—8** **7 Claims**



A gear cutting apparatus, especially for cutting gears on a gear blank of elliptical cross section, wherein a rotatable cutting tool reciprocable in a direction normal to its axis of rotation cuts helical teeth in the gear blank which is mounted for rotation about an axis parallel to the direction of reciprocation of the cutting tool.

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**3,651,738**

**POT BROACHING MACHINE**

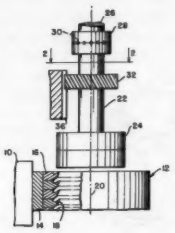
**Benjamin F. Bregi, Grosse Pointe Shores, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.**

**Filed Jan. 26, 1970, Ser. No. 5,723**

**Int. Cl. B23f *9/04***

**U.S. Cl. 90—10** **5 Claims**

A pot broaching machine for broaching helical teeth on the periphery of a circular work piece in which helical guide means control rotation between the broach and work piece during the initial cutting action, after which the helical guide means becomes inoperative, and guiding action is provided



by engagement between the broach teeth and the helical broached surfaces on the work piece.

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**3,651,739**

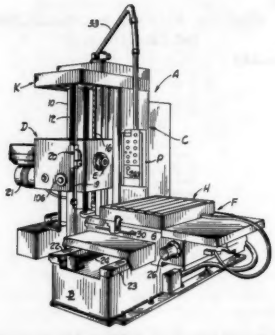
**MACHINE TOOL**

**Heinz K. Wolf, Willoughby Hills, Ohio, assignor to The New Britain Machine Company, New Britain, Conn.**

**Filed Jan. 30, 1970, Ser. No. 7,194**

**Int. Cl. B23c *1/00***

**U.S. Cl. 90—11 D** **4 Claims**

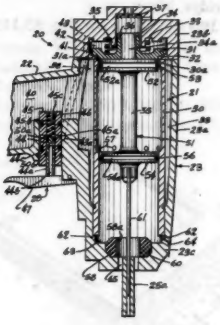


A machine tool including a movable spindlehead member having a rotatable tool spindle member reciprocable lengthwise parallel with its axis of rotation, and a work-supporting compound slide assembly having two slide members movable in directions at right angles to one another. All members can be selectively moved at feed and traverse rates in opposite directions by variable speed motors, one connectable to the spindlehead or the tool spindle and the other to either of the two slide members of the work-supporting compound slide. The motors are connected to their respective tool and work-moving members through discrete transmissions of the continuously meshed gear type under the control of hydraulically actuated clutches. Spindle feed is alternatively provided from a spindle drive motor to correlate feed with rotation. The tool spindle is provided with spring-biased mechanism for engaging a tool arbor having a tapered shank and retaining the same in a suitable tapered tool arbor socket provided in the front or tool end of the spindle and fluid pressure actuated compound motor means for releasing the tool arbor from the spindle arbor socket.

## 3,651,740
## PNEUMATIC DRIVING TOOL WITH A FAIL-SAFE MECHANISM

Garry R. Perkins, Cary, Ill., assignor to Spotnails, Inc., Rolling Meadows, Ill.

Filed Nov. 24, 1969, Ser. No. 879,316
Int. Cl. F15b *15/17, 15/22;* F01b *11/02*
U.S. Cl. 91—417 A 9 Claims

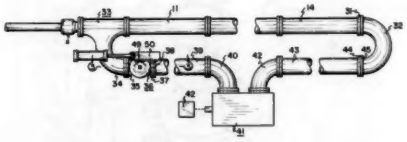


A pneumatic driving tool is provided which incorporates a fail-safe mechanism for preventing damage to the tool when an abnormal operating condition occurs. The mechanism includes an elongated cylinder and a piston mounted within said cylinder for normal reciprocatory movement between longitudinally spaced first and second positions. If the piston moves to a third position which is adjacent the second position but at a greater distance from said first position, due to an abnormal wear condition, the piston will automatically remain at said third position until the abnormal wear condition is corrected.

## 3,651,741
## SAW MILL FEEDWORKS

James L. Sylvester, Salt Lake City, Utah, assignor to Gardner Machines, Inc., Salt Lake City, Utah

Filed May 11, 1970, Ser. No. 36,105
Int. Cl. F15b *11/04, 13/044*
U.S. Cl. 91—435 8 Claims

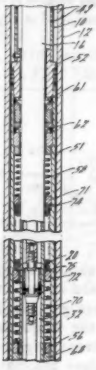


A feedworks for sawmills incorporating structure for converting steam systems to water-drive systems and, irrespective of the type of drive system employed, including means for interrupting or metering fluid-flow in the feedworks for stopping or at least slowing down the feedworks' carriage when traveling at an excessive speed proximate its extremity of travel, as a safety feature.

## 3,651,742
## LINEAR DRIVE AND SUPPORT FOR VERTICALLY MOVABLE CONTROL RODS

Gordon R. Winders, Olney, Md., assignor to Diamond Power Specialty Corporation

Filed Aug. 21, 1970, Ser. No. 65,961
Int. Cl. F16j *1/00*
U.S. Cl. 92—30 7 Claims

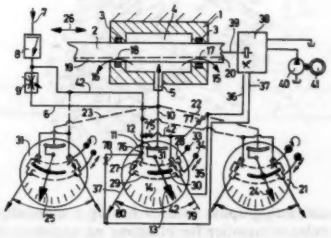


A vertically disposed elongated cylinder includes a hydraulically actuated piston carried by a hollow piston rod which extends downwardly from the piston through friction-holding means consisting of a series of annular collet assemblies which are spring biased to holding engagement with the piston rod. A coupler for the load is operable from the upper end of the cylinder by a coupling rod extending upwardly through the piston and piston rod.

## 3,651,743
## PNEUMATIC MEASURING DEVICE

Erich G. Henke, 7000 Stuttgart, Immenhofestr 19, Stuttgart; Helmut F. Braun, 7993 Kresbronn, Kirchstr 7; Karl L. Scholl, 7993 Kresbronn Argenstr 76, both of Kressbronn, and Rudolf Schubert, 899 Lindau Obenietnauerstr 24, Lindau, all of Germany

Filed June 3, 1970, Ser. No. 43,017
Claims priority, application Germany, June 6, 1969, P 19 28 854.1
Int. Cl. G01b *13/00*
U.S. Cl. 73—37 11 Claims



An apparatus which, at a remote position, will indicate the position of two parts which are shiftable relative to each other, such as parts located proximate to explosive means. This is accomplished by a device which is chargeable with compressed air, the relative movement of said parts reflect-

ing itself in changes of the air pressure which changes, in turn, actuate an indicating means.

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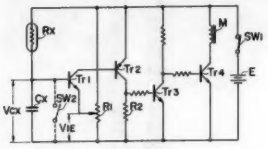
**3,651,744**

## PHOTOGRAPHIC CAMERA

**Takaaki Okada, Ageo-shi, Japan, assignor to Kabushiki Kaisha Koparu**

**Filed Dec. 29, 1969, Ser. No. 888,515**
**Claims priority, application Japan, Jan. 13, 1969, 44/2543**
**Int. Cl. G03b 7/08, 17/18; G01j 1/46**
**U.S. Cl. 95—10 CT** **17 Claims**




When indication of exposure time is required, an oscillation circuit means housed in the photographic camera is actuated. The signal waves generated consecutively from said circuit means are of the frequencies and waveforms corresponding to the different brightnesses of the object to be photographed. The values associated with said frequencies and waveforms are determined by a measuring means including an indicator. Then, this indicator permits the exposure time to be expressed.

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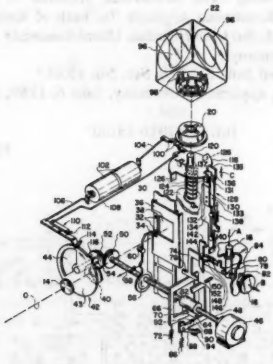
**3,651,745**

## FLASH DEVICE FOR CINEMATOGRAPHIC CAMERA

**William P. Ewald, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Apr. 28, 1969, Ser. No. 819,721**
**Int. Cl. G03b 21/38**
**U.S. Cl. 95—11.5** **2 Claims**



In a cinematographic camera having a manually movable shutter-release member for effecting an exposure of a single frame of cinematographic film to take a still picture, a device is provided for using a flash-lamp unit to augment scene illumination.

The device comprises a socket for receiving a flash-lamp unit and means operatively connected to the shutter-release member for energizing the flash-lamp unit in synchronization with the exposure of a single frame of film.

In the preferred embodiment, the socket of the device is adapted to receive a flash-lamp unit having a plurality of flash lamps and is rotatable between a corresponding plurality of lamp-firing positions; and the device further comprises means for rotating the socket from one lamp-firing position to another in response to movement of the shutter-release member.

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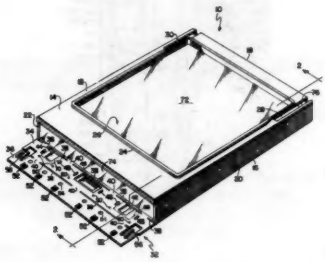
**3,651,746**

## FILM ASSEMBLAGE

**Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed July 15, 1970, Ser. No. 55,119**
**Int. Cl. G03b 17/52**
**U.S. Cl. 95—19** **17 Claims**



A film container for housing a plurality of film units and a battery for supplying energy for at least one component in photographic apparatus with which it is adapted to be used. One wall of the container includes two sections which are adapted to be moved into face-to-face relation with each other while the terminals of the battery are located therebetween to properly support the terminals for electrical engagement with contacts located within the photographic apparatus.

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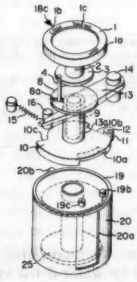
**3,651,747**

## FILM MAGAZINE UNLOADING MECHANISM IN A CAMERA

**Shuji Kimura, Setagaya, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Mar. 4, 1971, Ser. No. 121,003**
**Claims priority, application Japan, Mar. 10, 1970, 45/22605**
**Int. Cl. G03b 19/04, 17/26**
**U.S. Cl. 95—31 R** **1 Claim**



A camera using a film magazine and provided with a film magazine unloading mechanism which enables the film magazine to be readily taken out of a film magazine receiving

chamber in the camera without the need to detach the camera from a tripod or other support means and without the danger of injuring the film magazine and/or the film magazine receiving chamber. After the film has been exposed, rotating an operating knob on the camera body rotates one of the two concentric cylinders forming the magazine. This creates a light seal for the enclosed film by moving the film exit slits of the cylinders out of alignment. Rotating the knob further then objects the magazine from the camera through the opened camera back.

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### 3,651,748
### CAMERA IRIS BLADE

**Risaburo Yoshiada, Tokyo-to, Japan, assignor to Nikon Eigakikai Kabushiki Kaisha (Japan Cine Equipment Mfg. Co., Ltd.), Tokyo-to, Japan**

**Filed Dec. 11, 1969, Ser. No. 884,113**
**Claims priority, application Japan, Dec. 13, 1968, 43/91899**
**Int. Cl. G03b** *9/02*
**U.S. Cl. 95—64 R** **1 Claim**

An iris blade with an integral exposure indicator formed from a sheet of synthetic resin having different colored areas, one color for the indicator and another color for the blade.

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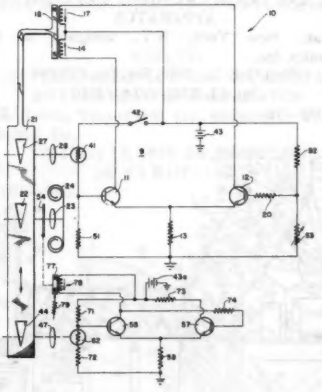
### 3,651,749
### EXPOSURE CONTROL APPARATUS

**Gerald H. De Groot, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Oct. 1, 1970, Ser. No. 77,077**
**Int. Cl. G03b** *7/10, 19/18;* **G01j** *1/44*
**U.S. Cl. 95—64 D** **2 Claims**



An automatic exposure control apparatus is disclosed which includes a compensating filter which is movable between a first position wherein it is disposed in optical alignment with the camera lens to adjust the color balance of incident ambient light available for exposure and a second position wherein it is withdrawn from alignment with the camera lens; a photocell which produces a discernable output signal in response to artificial lighting having substantial components in the infrared portion of the light spectrum; and an electrically actuable device coupled to the compensating filter and adapted to move the compensating filter to the second position out of alignment with the camera lens in response to the signal.

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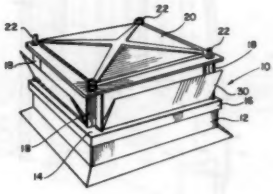
### 3,651,750
### CLOSURE FOR A ROOF VENTILATOR

**Thomas R. Field, Indianapolis, Ind., assignor to Jenn-Air Corporation, Indianapolis, Ind.**

**Filed Aug. 5, 1970, Ser. No. 61,251**
**Int. Cl. F24f** *7/02*
**U.S. Cl. 98—85** **4 Claims**



A pre-tensioned closure for a side exhaust opening through wall of a building roof ventilator wherein a damper is pivotally received within a frame opening and torsion bar biased to closed position and wherein the frame thereof is vertically received within the ventilator wall opening in a manner whereby higher than atmospheric pressure within the ventilator urges the damper against the torsion bar for at least partial opening for permitting outward passage of air, but the damper is normally biased to a vertically closed and weather sheltered position within the frame.

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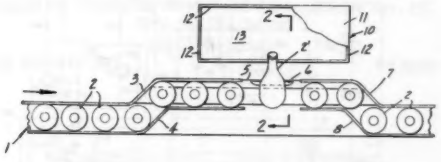
### 3,651,751
### DISGORGER

**Benjamin F. Randrup, 1488 High School Road, Sebastopol, Calif.**

**Filed Jan. 19, 1970, Ser. No. 3,784**
**Int. Cl. C12h** *1/06*
**U.S. Cl. 99—275** **7 Claims**



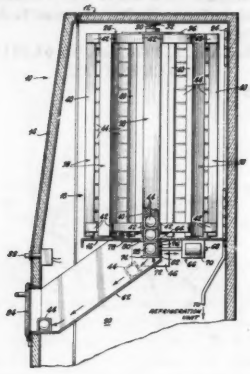
The contents of a bottle neck containing sediment are disgorged by tilting the upright bottle from the vertical and removing the crown cap to permit the internal pressure in the bottle to disgorge the contents of the neck. Means is provided for impacting the sidewall of the bottle to enhance the disgorging operation. The apparatus includes means for sensing the presence of the bottle on a conveyor and means for stopping the conveyor while the bottle is tilted and decrowned.

3,651,752

## METHOD AND APPARATUS FOR HEATING AND DISPENSING INDIVIDUALLY PACKAGED FOOD PRODUCTS

Donald J. Roslonski, Pennsauken, N.J., assignor to National Electro-Cook Corporation, Mount Laurel, N.J.

Filed Jan. 26, 1970, Ser. No. 5,854
Int. Cl. H05b 3/00
U.S. Cl. 99—357 6 Claims



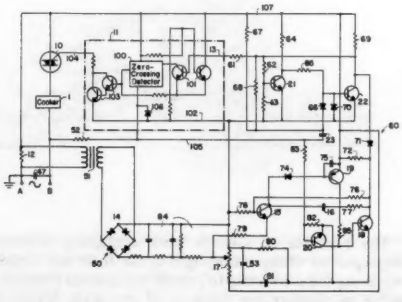
A method and apparatus for sequentially heating and dispensing a plurality of individually packaged good products, wherein the products are sequentially moved to, and supported at, a heating-dispensing station. While at such such station, each product is heated by passing an electrical current therethrough and then dispensed by removing the support therefor so that the product gravitates away from the station.

3,651,753

## ELECTRIC COOKER WITH AUTOMATIC CURRENT CONTROL

Walter Schmidt, Lindau-Bodolz, Germany, assignor to Intertrade Warenverkehrsgesellschaft Hild & Co., Vienna, Austria

Filed Sept. 17, 1970, Ser. No. 73,030
Claims priority, application Austria, Sept. 17, 1969. A8824/69; June 15, 1970, A5394/70
Int. Cl. H05b 7/00
U.S. Cl. 99—358 8 Claims



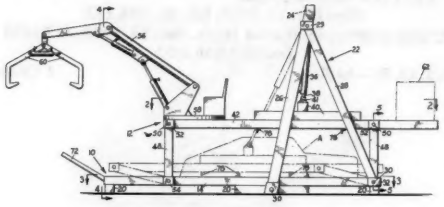

An electric cooker for the direct heating of food by the passage of alternating current therethrough has a two-way electronic valve, triggered at the beginning of each half-cycle of its power supply, connected in series therewith. A control voltage derived from a series resistor, varying with the magnitude of the load current, blocks the trigger circuit of the valve during half-cycles of a given polarity whenever the current exceeds a predetermined threshold, the trigger circuit being unswitchable during half-cycles of the opposite polarity so that only complete cycles are suppressed in the case of overload.

3,651,754

## COMPACTING AND FORMING APPARATUS

Sheldon R. Forest, 566 Mill Road, Lewiston, Idaho

Filed Aug. 25, 1969, Ser. No. 852,588
Int. Cl. B30b 15/30
U.S. Cl. 100—91 5 Claims



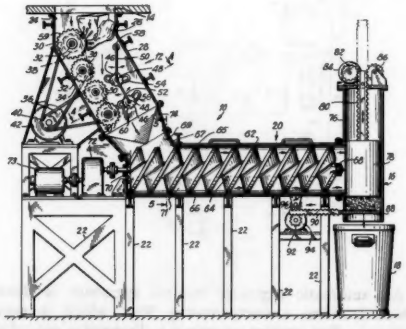
Apparatus is provided including a base to which is connected an upright A-frame. Pivotally connected to the base by four corner posts is a forming frame disposed generally parallel to the base frame and pivotal on its end posts between upright and collapsed positions by fluid operated cylinders connected between the A-frame and the forming frame. Articles to be compacted or formed are placed on the base, and pivoted movement of the forming frame on its posts provide the compacting or forming forces; such forces acting simultaneously in linear and compacting directions. A loading boom is supported on the forward end of the forming frame for moving articles to the apparatus. The front end of the base frame has anchor means which serve to support articles for pretreatment prior to placing them in the apparatus.

3,651,755

## WASTE AND TRASH CRUSHING AND COMPACTING APPARATUS

Louis Gati, New York, N.Y., assignor to Pollution Techtronics, Inc.

Filed Oct. 21, 1969, Ser. No. 868,091
Int. Cl. B30b 1/24, 15/30
U.S. Cl. 100—96 21 Claims



Crusher and compacter for waste material particularly trash and other residential type waste material particularly

adapted for disposition as at the bottom of a chute to enable trash deposited therein to be compacted to facilitate removal thereof from the premises, as for incineration or burial at a remote location.

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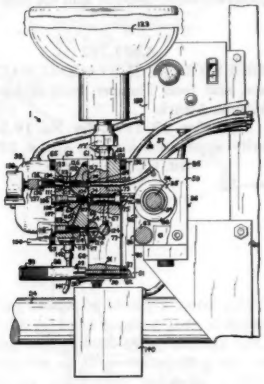
3,651,756

## SPRAY DAMPENING SYSTEM WITH INDIVIDUAL METERING PUMPS FOR OFFSET PRESS

Roy R. Smith, Jr., 9714 Cherokee Lane, Leawood, Kans., assignor to Roy R. Smith, Jr., Leawood, Kans.

Filed Aug. 11, 1969, Ser. No. 849,050
Int. Cl. B41l 25/06
U.S. Cl. 101—147 9 Claims



Individual, low volume metering pumps are provided for supplying moisture to each nozzle in a bank of adjacent nozzles directing moisture toward the inking train. The metering pumps are driven through commonly mounted eccentric cam rollers respectively engaging adjustable rocker arms for accurately varying the moisture output of each nozzle while variation of a master drive controls overall bank output. Selectively operable pistons are associated with individual output check valves for system priming or bubble clearance.

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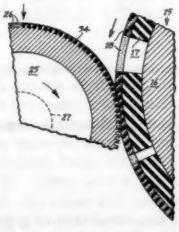
3,651,757

## INK METEREING DEVICE FOR TEXTILE FABRIC ROTARY PRINTING APPARATUS

Grover Z. Gowin, Tunnel Hill, Ga., assignor to Gowin-Card, Inc., Dalton, Ga.

Filed May 12, 1970, Ser. No. 36,567
Int. Cl. B41f 31/06
U.S. Cl. 101—350 4 Claims



A printing apparatus for a web of pile fabric including a printing roll having a compressible absorbent cover material, a pressure roller adapted to force the fabric web into printing position against the cover material, and a meter roll having a hard surface, and uniformly spaced, uniform longitudinal grooves in the surface for receiving liquid dye, the hard grooved surface being adapted to squeeze the absorbent cover material on the printing roll to dispense metered amounts of dye into the printing roll cover material prior to printing the fabric.

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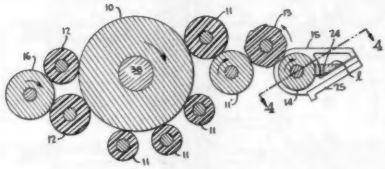
3,651,758

## INK TRANSFER SYSTEM

Jimmie A. Harrod, Middleport, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed Dec. 17, 1969, Ser. No. 885,748
Int. Cl. B41f 31/26; B21b 27/02
U.S. Cl. 101—350 8 Claims



An ink transfer system for a rotary printing press wherein a helically grooved transfer roll is provided for effectively transferring toward a plate cylinder an ink volume consistent or equal to the usage requirements at any given point or area on the roll surface as determined by the printed image. The transfer roll has the ability to simultaneously transfer ink reversely back onto the fountain roll by reason of its helical grooves being in light contact with a relatively slowly rotating fountain roll. An offset groove and ball arrangement is provided for one of the distribution rolls in the printing press chain of rollers so as to smoothly oscillate the roll for a more even distribution of the ink transversely of each roll in the ink train. The inner face of each fountain roll mount is slightly relieved so as to direct ink away from the outermost ends of the fountain roll thereby substantially preventing fountain leakage.

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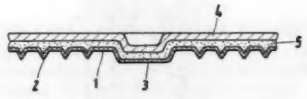
3,651,759

## PRINTING FORMS

Gerhard Ritzerfeld, Franzensbaderstra 21, Berlin, 33, Germany

Original application Mar. 23, 1967, Ser. No. 625,344, now Patent No. 3,536,008. Divided and this application Apr. 15, 1970, Ser. No. 28,707
Int. Cl. B41n 1/06
U.S. Cl. 101—395 8 Claims



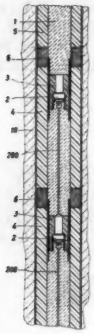
A composite printing foil produced by applying to one face of an aluminum foil formed with spaced projections extending outwardly at the other face of the foil, a supporting layer of synthetic resin or paper and the like which layer has a thickness between about one-half and one-and-a-half times the thickness of the aluminum foil.

3,651,760

## IGNITION SYSTEM FOR WARHEAD

Manfred Held, Pottmes, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed Oct. 13, 1969, Ser. No. 865,888
Claims priority, application Germany, Oct. 16, 1968, P 18 05 467.6
Int. Cl. F42c *11/04, 15/40, 19/06*
U.S. Cl. 102—70.2 A 9 Claims



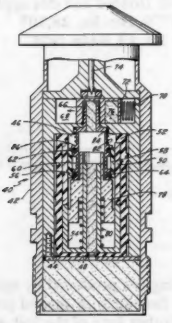
An ignition system, for the simultaneous ignition of several charges arranged in different cross-sectional planes of an elongated warhead and extending perpendicular to the longitudinal center line of the warhead, includes a rod displaceable along the longitudinal center line, relative to the cross-sectional planes, and having two possible positions spaced longitudinally from each other. The rod has, at locations therealong, and in cross-sectional planes corresponding to the cross-sectional planes of the warheads, devices operable to ignite the charges. The corresponding cross-sectional planes of the warhead and the rod coincide in one of the two possible positions of the head. These two positions can be termed, respectively, the "ignition locked" position and the "ignition released" position.

3,651,761

## ROCKET FUSE WITH A COCKED PISTON

David S. Breed, P.O. Box 349, Lake Hopatcong, N.J.

Filed Apr. 1, 1969, Ser. No. 811,968
Int. Cl. F42c *5/00, 7/00, 15/20*
U.S. Cl. 102—80 6 Claims



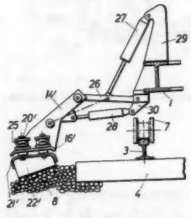
A rocket fuse including a dashpot timer in which a piston extension is adapted to hold a slider assembly in a retracted position. The slider assembly contains a detonator and also is under the influence of a spring which bears against the piston extension causing the piston to cock relative to the cylinder. A spring biased weight bears against the piston to hold it in a position at which the slider assembly is maintained in its retracted position by the piston extension. When the rocket is projected and experiences predetermined acceleration, the generated forces shift the weight away from the piston which is then adapted to travel in its cylinder. When the acceleration forces are present for a predetermined period of time and maintains the weight away from the piston, the movement of the piston in its cylinder will eventually cause the piston extension to clear the slider assembly. At this moment the slider assembly is shifted by means of its spring to a position at which the detonator is aligned with the detonator pin and the explosive train to thereby arm the fuse.

3,651,762

## MOBILE TRACK SURFACING MACHINE

Franz Plasser, and Josef Theurer, both of Johannesgrasse 3, A-1010 Vienna, Austria

Filed Mar. 13, 1970, Ser. No. 19,339
Claims priority, application Austria, Apr. 4, 1969, A 3366/69
Int. Cl. E01b *27/16*
U.S. Cl. 104—12 13 Claims



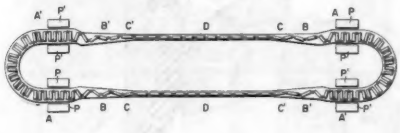
In a track surfacing machine, a vibratory surface tamper is mounted on a vertically adjustable carrier on the machine frame, and a generally planar resilient plate for damping the vibrations of the surface tamper is mounted between the tamper and the carrier.

3,651,763

## CONVEYING APPARATUS

Saihei Iritani, Okazaki, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Toyoda-cho, Kariya, Aichi, Japan

Filed Mar. 19, 1970, Ser. No. 20,969
Claims priority, application Japan, Mar. 29, 1969, 44/24216
Int. Cl. A63g *1/00*
U.S. Cl. 104—25 5 Claims



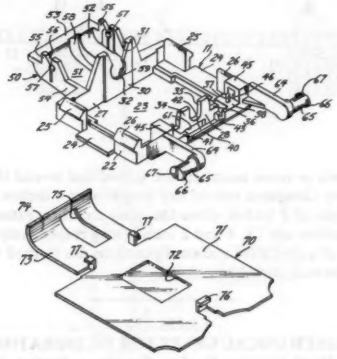
A conveying apparatus consisting of a group of transport member or vehicles, said vehicles being horizontally oscillatable relative to each other, and a pair of guide rails arranged in endless form or a closed loop circuit for guiding said vehicles, said vehicles being guided by said guide rails from parallel position into series position, and vice versa.

3,651,764

## MODEL RACING CAR

Gene Patrick Dennis, Pitman, N.J., and Cheng Ying Lai, Hong Kong, assignors to Tyco Industries, Inc., Woodbury Heights, N.J.

Filed Oct. 29, 1969, Ser. No. 872,027
Int. Cl. A63h 29/22; B61b 13/12
U.S. Cl. 104—149 7 Claims



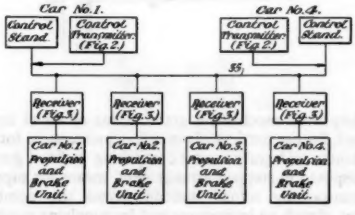
A model racing car frame having a motor mounted therein and provided with wheeled running gear, a depending guide shoe for guiding engagement in a roadway slot, the guide shoe being swingable about an upstanding axis, and resilient wipers carried for movement with the guide shoe and resilient engagement with the roadway.

3,651,765

## TRAIN LINE COMMUNICATION AND CONTROL STEM

Reed H. Grundy, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Apr. 14, 1970, Ser. No. 28,378
Int. Cl. B60l 15/08
U.S. Cl. 105—61 4 Claims



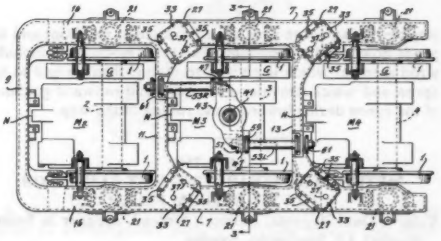

An asymetrical, astable multivibrator, at the control location for a multiple unit train, transmits a control signal having a selected duty cycle characteristic over a single train line channel. The duty cycle percentage is selectively varied by a transistorized switching bank which connects different resistors into the RC timing circuit for one-half of the multivibrator element, the other half having a fixed timing circuit. These switching transistors are selectively controlled by the train operator in accordance with the desired train operating mode. The transmitted control signal is received on each car and converted into an average voltage whose level varies with percent duty cycle. On each car, this average voltage is compared, in a transistorized comparator element, with a reference voltage preset in accordance with the desired operating mode of that car within the overall train operation. When the average voltage is less than the reference voltage, a controller on that car is actuated to control the car function. With different reference voltages preset on the several cars, sequential activation of the car control functions may be obtained.

3,651,766

## LOCOMOTIVE TRUCK

Richard L. Lich, Town and Country, Mo., assignor to General Steel Industries, Inc., St. Louis, Mo.

Filed Jan. 30, 1970, Ser. No. 7,137
Int. Cl. B61c 9/48; B61f 5/02, 5/14
U.S. Cl. 105—136 7 Claims



The invention provides a three axle motor truck for railway locomotives in which the body load is transmitted in equal shares to the truck frame at four points symmetrically spaced transversely and longitudinally of the truck with respect to the axles. Preferably the body load is transmitted to the truck frame by elastomeric sandwich devices which are yieldable in horizontal shear to permit relative lateral and swivel movements between the truck frame and body underframe. The truck frame includes a pair of transverse transoms positioned respectively between the middle and each of the end axles, and for transmitting draft and braking forces between the truck frame and the underframe and providing a swivel center for the truck, a transverse lever is fulcrumed at its midpoint on a vertical axis to the underframe at the center of the truck, and its ends are connected respectively to the opposite transoms by longitudinally extending links. This arrangement provides a swivel center nearly symmetrical with respect to the load-transmitting sandwich devices so that for swivel, none is required to deflect an excessive amount in shear. The longitudinal spacing of the elastomeric sandwiches provides a long arm opposing tendencies of the truck frame to tip during acceleration and thus transfer load from axle to axle. This effect is also enhanced by having all the motors extend in the same direction from the axles to their reaction connection to the truck frame.

3,651,767

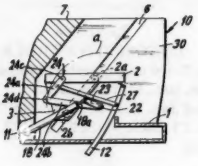
## MULTISTEP ENTRY PARTICULARLY FOR VEHICLES

Heinz Findeklee, Salzgitter-Lebenstedt, Germany, assignor to Linke-Hofmann-Busch Waggon-Fahrreug-Maschinen GmbH Postfach, Salzgitter-Watenstedt, Germany

Filed July 22, 1970, Ser. No. 57,118
Int. Cl. B61d 23/02
U.S. Cl. 105—448 5 Claims

A multistep construction particularly for rail vehicles comprises a fixed lower step and a step which is movable for bridging the differing entering heights between the fixed lower step and the floor of the vehicle. The movable step is connected to a lever mechanism in the form of two pivotal lever elements connected at their upper end to the step and

at their lower end to a shaft which is rotated by a moving member such as a piston and cylinder combination. The movable step itself is guided by rollers carried on an arm portion which engage in an inclined or oblique trackway defined in wall panels on each side of the entrance passageway. The step carries an apron which is articulated to the front and depends downwardly therefrom. The lever mechanism includes a rod member which is pivoted to the mechanism and to the apron and which provides an inward and outward guidance of the apron during lowering and raising of the step.



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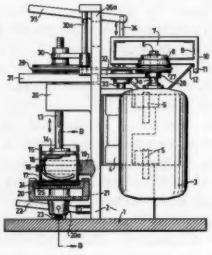
**3,651,768**

**METHOD FOR SEPARATING WET GLUTEN OR GLUTENIN FROM FLOUR**

**Kalervo Onni Hyppola, Helsinki, Finland, assignor to Falling Number AB, Stockholm, Sweden**

**Filed Apr. 6, 1970, Ser. No. 25,880**
**Claims priority, application Finland, Apr. 8, 1969, 1008/69**
**Int. Cl. A21c *1/06***
**U.S. Cl. 99—94** **5 Claims**



The invention relates to a method and an apparatus for separating wet gluten or glutenin from a dough of flour and water by kneading the dough and washing it by water so as to remove water-soluble constituents in the dough, the dough preparing step, the kneading and washing steps all being performed by means of agitating or stirring means in succession in one and the same vessel in such a manner that the speed of agitation or stirring is considerably higher during the dough preparing step than during the kneading and washing steps.

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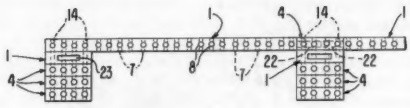
**3,651,769**

**PALLET CONSTRUCTION**

**Laurance J. Foley, 63 Almond Avenue, Los Altos, Calif.**

**Filed Nov. 3, 1969, Ser. No. 873,178**
**Int. Cl. B65d *19/12, 19/00***
**U.S. Cl. 108—56** **11 Claims**

A set of pallet-forming members is provided to form a wide variety of pallet sizes and configurations. The set comprises an elongated main member, at least one extender member shorter than the main member and a still shorter cap member. Connecting means are provided for joining said members to other identical members or to one or more of the other types of members. In any case the joining can be end-to-end to form an elongated unit or in juxtaposed parallel or angular relation. The three members are so dimensioned that when two or more members are joined end-to-end they form a unitary elongated unit of any length over 4 inches which is a multiple of 2 inches, since the main member, extender and cap member are 18, 4 and 2 inches long respectively. A wide variety of pallet sizes and configurations are formed with said pallet forming members.



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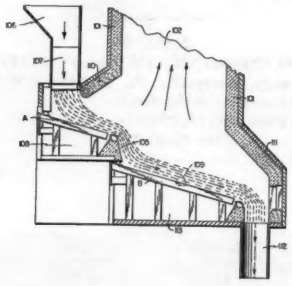
**3,651,770**

**MECHANICAL GRATE FOR INCINERATORS**

**George Hotti, Candiac, Quebec, Canada, assignor to Von Roll, A. G., Gerlafingen, Switzerland**

**Filed Apr. 23, 1970, Ser. No. 31,205**
**Int. Cl. F23g *3/00***
**U.S. Cl. 110—8 R** **5 Claims**



An improved mechanical grate means of novel design is disclosed, for use particularly in refuse incinerators for refuse of all kinds, said grate means comprising inclined grate sections disposed in stepped arrangement, means for supporting and transporting refuse thereon across the combustion chamber of such an incinerator and for supplying combustion supporting air and means for mechanically raking or agitating the fire bed to achieve complete incineration.

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**3,651,771**

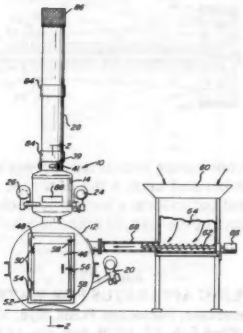
**INCINERATOR**

**Richard J. Eberle, Gwynedd Valley, Pa., assignor to Stainless, Inc., North Wales, Pa.**

**Filed Aug. 26, 1969, Ser. No. 853,014**
**Int. Cl. F23g *5/12***
**U.S. Cl. 110—8 A** **16 Claims**

An incinerator including primary and secondary combustion chambers and at least one transistion passageway interconnecting the same. At least one primary and at least one

secondary burner are utilized in the respective chambers. The secondary burner is tangentially fired with an aspirating action. Exit air is admitted through ports provided at the base of the stack to facilitate turbulence in a direction opposite to the direction of the tangentially fired secondary burner. Primary and overfire air are provided in the main combustion



chamber. Secondary air is introduced in the transition passageway. The exit air is introduced immediately above the secondary chamber at the base of the stack. The temperature in the primary chamber is preferably at least 1,100° F. and the temperature in the secondary chamber is preferably at least 1,400° F.

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**3,651,772**

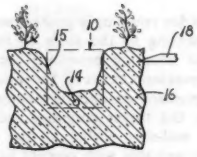
## METHOD AND SEED PELLET FOR USE IN PLANTING AGRICULTURAL CROPS

**Ross V. Garabedian, 921 Van Ness Avenue, Fresno, Calif.**

**Filed Nov. 21, 1969, Ser. No. 878,781**

**Int. Cl. A01c *1/06***

**U.S. Cl. 111—1** **6 Claims**



A method and seed pellet particularly suited for use in planting agricultural crops characterized by the provision of seed pellets including frozen bodies of selected fluids such as water or aqueous solutions of selected chemicals, such as fertilizers, herbicides, pesticides and the like, having discrete plant seeds embedded therein, and depositing the pellets in the soil, a feature of the invention being the adaptability thereof for use in planting relatively small seeds with a selected, uniform spacing and shallow covering in a moisturized environment.

**3,651,773**

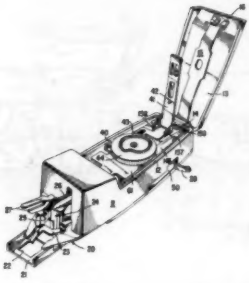
## MONOGRAMMING ATTACHMENT FOR SEWING MACHINES

**Joseph G. Rakacs, 33 Wood Haven Road, Green Island, Toms River, N.J.**

**Continuation-in-part of application Ser. No. 55,330, July 16, 1970, now abandoned. This application Sept. 11, 1970, Ser. No. 71,380**

**Int. Cl. D05b *3/24***

**U.S. Cl. 112—77** **6 Claims**



A work shifting attachment for a zigzag sewing machine in which an exchangeable pattern cam disk with a cam track formed in each face may be inserted through a hatch in the attachment cover into engagement with a cam drive and into cooperative relation with a pair of cam followers connected to shift a work clamp in a path appropriate for monogramming.

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**3,651,774**

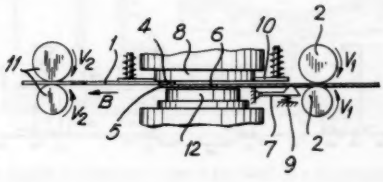
## METHOD OF CONTINUOUS FEED OF SEPARATE STRAPS IN PROCESS OF BLANKING

**Vitaly Konstantinovich Gilev, 811 proezd, 65, kv. 16; Volf Nakhimovich Evzlin, ulitsa Chapaeva, 102, kv. 53; Tofik Kudrat Ogly Idayatov, ulitsa Aga-Neimatully, 22, kv. 21; Nea Eachievna Proshian, ulitsa 28 Aprelya, 19, kv. 16; Rafael Tevosovich Sarkisov, ulitsa Aga-Neimatully, 20a, blok 3, kv. 28, and Ernst Arakelovich Stepanian, ulitsa Druzhby Molodezhi, 2, kv. 36, all of Baku, U.S.S.R.**

**Filed Oct. 13, 1969, Ser. No. 872,890**

**Int. Cl. B21d *43/00***

**U.S. Cl. 113—113 R** **1 Claim**



The invention relates to a method of continuous feed of separate straps during the blanking, comprising the following operations: the strap of sheet material to be blanked is fed into a die, the end of the blanked strap during the movement for a feed pitch prior to the last blanking operation is deflected aside with simultaneous movement of the next strap so that the beginning of the latter overlaps the deflected end of the blanked strap, in which case the last blanking operation is effected on the blanked strap, thereafter, both straps are moved simultaneously and at the same speed for a feed pitch; at the end of this movement, prior to the first

blanking operation on the next strap, the end of the blanked strap is withdrawn from the blanking zone at a speed exceeding the rate of feeding the strap into the blanking zone.

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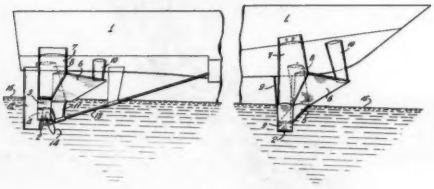
**3,651,775**

## HYDROFOIL SYSTEM

**Helmut Kock, Woodlyn Park Apt. C-242 1400 McDale Blvd., Woodlyn, Pa.**

**Filed Aug. 18, 1969, Ser. No. 850,743**
**Int. Cl. B63b 1/20**
**U.S. Cl. 114—66.5 H** **10 Claims**



The present invention relates to a hydrofoil system attached to a hull of a vessel.

The foil are attached to the hull of a vessel by means of non-lifting struts and each foil comprises a main lifting foil portion which consists of submerged middle section and two upwardly and outwardly inclined side sections which control the end position of the lift. In a spaced relation and parallel to the inclined sections, two auxiliary upper lifting foil portions are attached on each side of the hull for supporting the lifting action and stabilizing the vessel.

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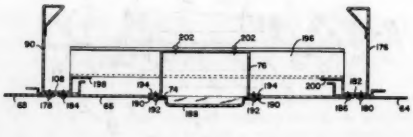
**3,651,776**

## MODULAR ACCOMMODATIONS

**Albert A. Hopeman, Jr., Bronxville, N.Y.; Frank L. Shiflet, and Howard G. Schultz, both of Waynesboro, Va., assignors to Hopeman Brothers, Inc., New York, N.Y.**

**Original application June 2, 1969, Ser. No. 829,347, now abandoned. Divided and this application Dec. 9, 1970, Ser. No. 96,356**
**Int. Cl. B63b 29/02**
**U.S. Cl. 114—71** **3 Claims**



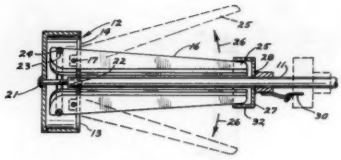
Ceiling panels for ships' accommodations are supported by troughlike assemblies, extending across the ceilings of cabins, the assemblies also containing lighting fixtures, air ducts and other utilities. Plumbing for a pair of adjoining cabins is preassembled into an enclosure, which extends between deck and ceiling, the bulkheads of the enclosure supporting wash basins, a toilet and associated fixtures. A prefabricated frame is provided including members for supporting ventilation ducts and lighting fixture in the bathroom ceiling and for receiving bulkhead panels and supporting bathroom ceiling panels.

**3,651,777**

## BOAT ANCHOR

**Merlin W. Ehrlichmann, Minnetonka, Minn., assignor to West Creek Co., Inc., Minnetonka, Minn.**

**Filed Apr. 15, 1970, Ser. No. 28,569**
**Int. Cl. B63b 21/44**
**U.S. Cl. 114—208 A** **7 Claims**



A boat anchor having anchor type prongs which fold along a center member and upon a tug of a rope can be released and will spread out to form a hook type anchor that will hold onto the bottom of the lake, or other object.

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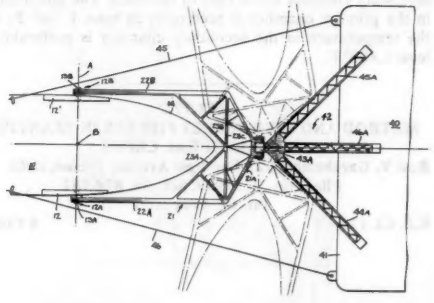
**3,651,778**

## COUPLING APPARATUS FOR WATERCRAFT

**Robert E. Derecktor, Parsonage Point, Rye, N.Y.**

**Filed Feb. 17, 1970, Ser. No. 11,978**
**Int. Cl. B63b 21/00**
**U.S. Cl. 114—235 R** **22 Claims**



An apparatus for coupling a pushed vessel with a pushing vessel by connecting to the stern of the pushed vessel a universal thrust coupling providing for three degrees of freedom of movement between the pushed vessel and an elongated compression connecting member connected at one end thereof to the thrust coupling and at the other end thereof to the mid-ship portion of the pushing vessel and being pivotably movable with respect to the pushing vessel about an athwartships axis of the latter, whereby said pushing and said pushed vessels are linked together for joint movement while being free to heave as well as roll, yaw and pitch relatively to one another.

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**3,651,779**

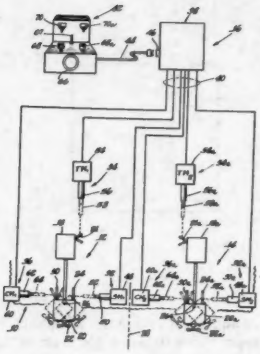
## ELECTRICAL STEERING SYSTEM FOR BOATS

**Calhoun Norton, Tequesta, Fla., assignor to Arens Controls, Inc., Evanston, Ill.**

**Filed Apr. 6, 1970, Ser. No. 25,874**
**Int. Cl. B63h 23/28**
**U.S. Cl. 115—35** **7 Claims**

There is disclosed a control system for electronically controlling a boat powered by a conventional twin screw in-

board--outboard drive system. The boat is maneuvered by a plurality of reversible direct current motors which are controlled through a complex electronic circuit system by a



portable control box. The portable control box is disengageably connected to the electronic system so that the boat may be maneuvered from any position thereon.

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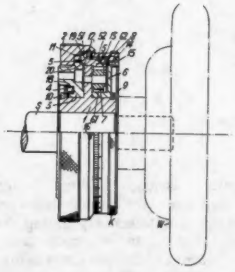
3,651,780

## ROTARY INSTRUMENTS FOR INDICATING LINEAR MEASUREMENTS

Cyril W. Medhurst, Woking, England, assignor to British Aircraft Corporation, London, England

Filed Oct. 8, 1969, Ser. No. 864,838
Claims priority, application Great Britain, Oct. 25, 1968, 50,852/68
Int. Cl. B23q *17/00*
U.S. Cl. 116—115.5 12 Claims



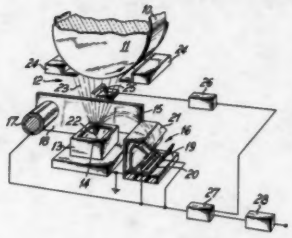
A compact rotary dial unit for accurately measuring small movements of a machine-tool lead-screw, the unit having one continuous decimally divided scale which indicates the measurement in either the metric or the inch system, as initially selected by the operator; the unit encloses an epicyclic gearing which when changed from a nonoperating to an operating condition causes a change (simply related to 2.54) in the rotation speed of the scale.

3,651,781

## METALLIC VAPOR DEPOSITION ARRANGEMENT

Klaus Brill, Stuttgart-W, and Wolfgang Grothe, Stuttgart-Vaihingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 27, 1970, Ser. No. 23,340
Claims priority, application Germany, Mar. 28, 1969, P 19 15 933.2
Int. Cl. H01j *37/26*
U.S. Cl. 118—7 11 Claims



An arrangement for the vapor deposition of metallic layers upon moving bands of insulating material. The metal is vaporized in a crucible through an electron beam generated by an electron gun. The electron beam serves to both vaporize the metal and ionize the vapor stream emerging from the crucible. The vapor stream is directed upon a predetermined surface of the moving band of insulating material. Within the vapor stream is located a probe which transmits current to a regulator for the purpose of monitoring and regulating the thickness of the deposited metallic layer.

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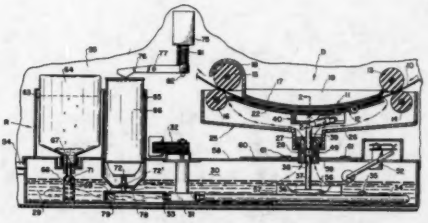
3,651,782

## LIQUID DEVELOPMENT APPARATUS

William A. MacDonald, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 2, 1969, Ser. No. 854,600
Int. Cl. B05c *3/02*; B05b *5/02*; G03g *15/00*
U.S. Cl. 118—411 1 Claim



A liquid developing station is provided in a copying device for developing electrostatic images on receivers in a manner such that distribution of developing liquid across the receiver is very uniform. A liquid reservoir for the development liquid is provided which is adapted to receive separate containers for supplying additional carrier or developing liquid and toner particles. The liquid is dispensed directly into the reservoir by inserting a container thereof into a first receptacle in the top of the reservoir. Toner particles are supplied in an aerosol can which may be positioned in a second receptacle with the nozzle thereof adjacent an inlet to a liquid pump within the reservoir. To add toner, the operator may energize a circuit which upon the next operation of the copying device will cause the aerosol can to dispense a measured quantity of

toner particles into the pump inlet so that it is immediately circulated and mixed in the developing liquid for the next print. After each print cycle, developing liquid quickly drains from the developing station into the reservoir.

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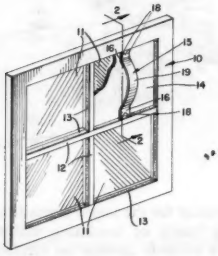
**3,651,783**
**PAINT SHIELD FOR WINDOWS**
**Lawrence F. Ribbecke, Brooklyn, N.Y., assignor to Sapolin Paints, Inc., New York, N.Y.**
**Filed Nov. 19, 1970, Ser. No. 97,426**
**Int. Cl. B05b** *15/04*
**U.S. Cl. 118—505** **3 Claims**



A one-piece spring clamp has ends which engage opposed mullions or caulking frictionally. The clamp presses a cardboard paint shield firmly against the adjacent window pane.

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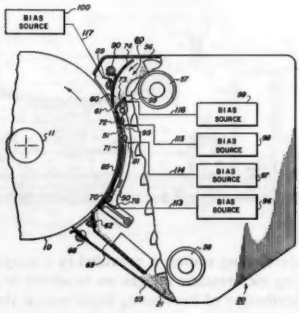
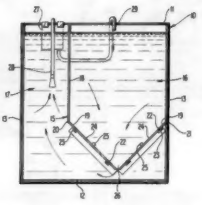
**3,651,784**
**LOW POTENTIAL DEVELOPMENT ELECTRODE**
**Robert E. Hewitt, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.**
**Filed July 3, 1969, Ser. No. 838,779**
**Int. Cl. G03g** *13/00*
**U.S. Cl. 118—636** **6 Claims**




A low potential electrode for use in a xerographic development system. The electrode is positioned adjacent to the point of entry of a moving image bearing photoconductive surface into a development zone and has associated therewith means for redirecting the flow of developer material moving between the electrode and the photoconductive surface whereby the developer material impinges against the photoconductive surface.

**3,651,785**
**AQUARIUM HAVING BUILT-IN MEANS TO PREVENT CANNIBALISM**
**Clayton E. Quinn, Airport Lake, Roebuck, S.C.**
**Filed Mar. 20, 1970, Ser. No. 21,318**
**Int. Cl. A01k** *63/00*
**U.S. Cl. 119—5** **2 Claims**



A transparent aquarium tank has a permanently built-in divider wall forming compartments for mature fish and newborn fish. The breeding compartment containing the mature fish has a narrow passage at the bottom through which the new-born fish gravitate into the separate compartment where they are protected from cannibalism. The divider wall has removable panels to facilitate cleaning and decorating of the aquarium, and also allow opening up of the aquarium when not in use for breeding purposes.

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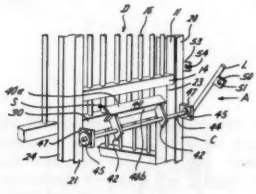
**3,651,786**
**ANIMAL CAGE DOOR LOCKING DEVICE**
**Carol M. Patterson, and Thomas E. Lero, both of Bryan, Tex., assignors to Research Equipment Company, Bryan, Tex.**
**Filed Apr. 1, 1971, Ser. No. 130,406**
**Int. Cl. A01k** *1/00*
**U.S. Cl. 119—17** **2 Claims**



The specification discloses a door locking device for locking sliding cage doors for animal cages and particularly including means for simultaneously urging the sliding door laterally against the side of its track and longitudinally against a stop to prevent such door from being rattled by occupants of the cage.

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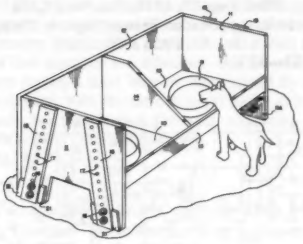
**3,651,787**
**ADJUSTABLE PET FEEDING STAND**
**Pauline E. Cooper, Route 2, P.O. Box 65, Harrisburg, Oreg.**
**Filed Apr. 22, 1970, Ser. No. 30,786**
**Int. Cl. A01k** *05/00*
**U.S. Cl. 119—51** **2 Claims**

A feeding stand for household pets and having adjustable support members which upon downward extension raise the

food supporting base to a desired height above the floor surface according to the size of the animal being fed. The support members may be fully retracted to locate the stand in a lowermost position whereat the side walls and back wall are in resting contact with the floor surface.



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**3,651,788**

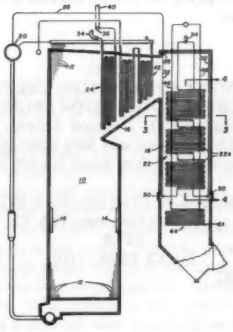
**SONIC VIBRATION BAFFLES**

**Norman C. Chayes, Bloomfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.**

**Filed Nov. 20, 1970, Ser. No. 91,503**

**Int. Cl. F22b *1/00***

**U.S. Cl. 122—4 R** **6 Claims**



The tubular elements which make-up the tube bundles in the gas duct of a furnace are arranged in a manner which prevents formation of destructive standing waves by the gas stream in the duct. The tubular elements are generally in side by side relationship across the gas duct and each comprise a number of tube runs which are spaced in the direction of gas flow and are transverse thereto. The majority of the tubular elements occupy one positioning in the direction of gas flow and a selected minority of tubular elements are offset in the direction of gas flow such that their tube runs impede or baffle the lateral motion of the gas stream which gives rise to standing waves. Those tubular elements which are offset are at or near locations across the duct at which baffle plates have formerly been used to prevent formation of standing waves.

**3,651,789**

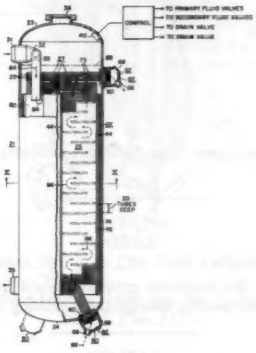
**STEAM GENERATOR**

**Angelo Robert Giardina, Broomall, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed June 13, 1968, Ser. No. 736,777**

**Int. Cl. F22b *1/02***

**U.S. Cl. 122—32** **13 Claims**



A compact liquid-metal heated vapor generator 21 whose liquid metal is typically sodium and whose secondary fluid is water. The water is conducted through tubes 29 of serpentine configuration with the serpentine turns nested in trombone-slide relationship. The tubes 29 are in separate modular bundles 27 and the modules extend throughout the interior of the pressure vessel 22. The modules 27 are separated into separate sections by support plates or baffles 44 and each module has a separate inlet 50 and outlet 52 for its tubes 29. The distribution of the sodium over the tubes 29 is effected by conducting the sodium from its inlet through a pool and introducing reverse flow (see arrows 84) of the sodium before it impinges on the modules 27. The tubes 29 of each module are sealed through separate tube sheets 54 (FIG. 3), at the feed-water inlet 50 and the vapor outlet 52 and feed water is admitted and the steam derived through separate nozzles 66, respectively, for each module.

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**3,651,790**

**INSTALLATION TO PRODUCE RAPIDLY A HEATED FLUID**

**Rene Louis Barrault, and Roland Edmond Weber, both of 39 avenue du petit Chambord, 92 Bourg la Reine, France**

**Filed Apr. 28, 1970, Ser. No. 32,652**

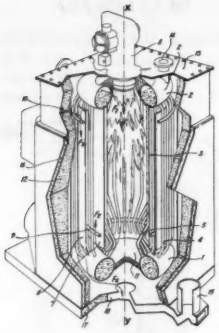
**Claims priority, application France, Apr. 28, 1969, 6913394**

**Int. Cl. F27b *21/04***

**U.S. Cl. 122—182 R** **4 Claims**

In a multi-water-tube boiler installation a pair of horizontally arranged vertically spaced toroidal water reservoirs extend concentrically about a vertical axis. The reservoirs are interconnected by a plurality of generally vertically extending concentrically arranged rows of tubes and baffles are connected between adjacent rows of tubes so that heating gases directed downwardly from a centrally arranged burner flow first over the innermost row of tubes and then are guided for flow in the axial direction serially over the remaining rows of tubes. Annular rings are provided at least about the outer rows of tubes for directing a fluid over the tubes to remove soot. The burner, reservoirs, and tubes form a unitary as-

sembly suspended from the roof of the boiler housing. The boiler housing is insulated and a feed water tank for supply-



ing water to the reservoirs extends around the housing for recovering heat passing through the insulating material.

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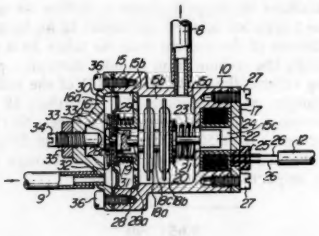
**3,651,791**

## SYSTEM FOR CONTROLLING FUEL SUPPLY TO AN INTERNAL COMBUSTION ENGINE

**Hisanori Kobayashi, Kariya-shi, Japan, assignor to Nippondenso Kabushiki Kaisha, Showa-cho, Kariya-shi, Aichi-ken, Japan**

**Filed June 18, 1970, Ser. No. 47,530**
**Claims priority, application Japan, Aug. 7, 1969, 44/62466**
**Int. Cl. F02m** *51/00*
**U.S. Cl. 123—32 EA** **2 Claims**



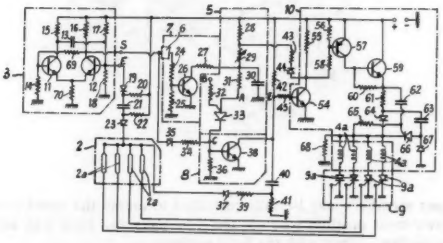
A system for controlling fuel supply to an internal combustion engine having a device for sensing pressure within an intake manifold of the engine. The device has bellows operable in response to variation in absolute pressure value within the intake manifold in normal operation of the engine to cause a core to move relative to an electrical coil so that electrical signals are emitted to cause the amount of fuel supply to be controlled in accordance with the state of engine operation represented by the pressure within the intake manifold. The device also has a diaphragm operable in response to variation in pressure differential of more than a predetermined value between the pressure within the intake manifold and the atmospheric pressure to displace normal operative position of the bellows relative to the coil in a direction in which the amount of fuel supply is increased, said predetermined value of the pressure differential being set to represent the state of engine operation which requires a greater output to be produced by the engine.

**3,651,792**

## ELECTRONIC INJECTION CONTROL MEANS FOR INTERNAL COMBUSTION ENGINES

**Louis A. Monpetit, Etang-La-Ville, France, assignor to Societe Des Procedes Modernes D'Injection Soproml, Les Mureaux, France**

**Filed Aug. 27, 1970, Ser. No. 67,336**
**Claims priority, application France, Sept. 5, 1969, 6930283**
**Int. Cl. F02b** *3/00, 33/00*
**U.S. Cl. 123—32 EA** **11 Claims**



In fuel injection systems, a method and apparatus for preventing overlap of injections and thus increasing the efficiency of internal combustion engines and reducing the production of air-polluting combustion products. The system includes means for producing a series of delay pulses in response to engine rotation. Each delay pulse, which is of short duration in comparison to an injection pulse, disables the power control unit of the injectors for its duration. The termination of said delay pulse triggers the generation of the injection pulse as well as actuating the power control unit and producing a distributing pulse which activates distributing means for energizing the proper injector the desired energization sequence.

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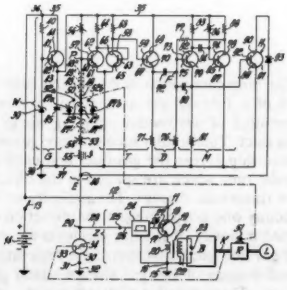
**3,651,793**

## ARRANGEMENT FOR LIMITING THE SPEED OF INTERNAL COMBUSTION ENGINES

**Helmut Roth, Stuttgart O; Gerhard Sohner, Geradstetten; Gerd Hohne, Ludwigsburg, and Jorg Issler, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

**Filed Feb. 6, 1970, Ser. No. 9,282**
**Claims priority, application Germany, Feb. 12, 1969, P 19 06 883.8**
**Int. Cl. F02d** *11/10*
**U.S. Cl. 123—102** **20 Claims**



An arrangement through which the speed of an internal combustion engine is limited by inhibiting the generation of

ignition or fuel injection pulses. An alternating current voltage generator is driven from the crank shaft of the engine and provides a voltage signal which is dependent upon the speed of the engine. A monitoring unit connected to the voltage generator provider pulses with amplitudes or pulse levels dependent upon the speed of the engine. When the amplitudes of the pulses exceed a predetermined magnitude corresponding to a predetermined engine speed, an electronic switch becomes actuated so that electrical pulses used for ignition and fuel injection are inhibited. Inhibition of the pulses takes place during a time interval determined by a monostable multivibrator, with the time interval being at least as long as necessary for suppressing the next oncoming pulse used for ignition or fuel injection purposes.

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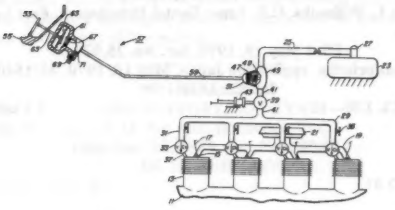
**3,651,794**
**THROTTLE FOR GASEOUS FUELS**

**Lloyd A. Douglas, Fort Worth, Tex., assignor to Victor Equipment Company, Denton, Tex.**

**Filed June 15, 1970, Ser. No. 46,003**
**Int. Cl. F02m *21/02***
**U.S. Cl. 123—120** **6 Claims**



An accelerator control system for an automobile employing a gaseous fuel in an internal combustion engine, characterized by a dome loaded pressure regulator interposed between a fuel reservoir and an intake manifold; and a fluid sealed signal conveying unit connected with the dome of the pressure regulator and responsive to movement of an accelerator pedal to transmit rapidly acceleration and deceleration signals to the pressure regulator and correspondingly increase or decrease the intake manifold pressure. The engine has a separate air intake manifold but its power; and, hence, r.p.m. at a given load condition; are controlled by the pressure regulator. Also disclosed are preferred embodiments which employ a shut-off valve intermediate the manifold and the fuel source, adjustable flow restrictions in conduits leading to the individual cylinders to obtain even fuel distribution, and trim pressure adjustment on the signal conveying unit for controlling the idling manifold pressure.

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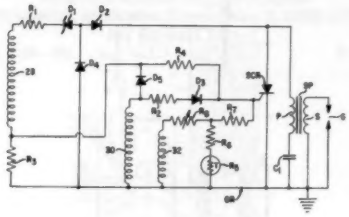
**3,651,795**
**MAGNETO EXCITED CONDENSER DISCHARGE IGNITION SYSTEM**

**Ray C. Noddin, Chicopee, Mass., assignor to Eltra Corporation, Toledo, Ohio**

**Filed July 6, 1970, Ser. No. 52,429**
**Int. Cl. F02p *1/00***
**U.S. Cl. 123—149 A** **2 Claims**

A dynamoelectric generating device for internal combustion engines combining a breakerless ignition system of a condenser discharge type with an alternator for generating electrical power wherein the energizing and timing coils for the ignition system are mounted on a stator with the power generating coils, both being excited by a rotating permanent magnet structure driven by the engine. An automatic spark



advance is provided actuated at a predetermined engine speed.

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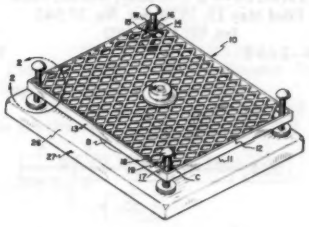
**3,651,796**
**GRILL**

**Walter A. Nelson, Salt Lake City, Utah, assignor to Rite Way, Inc., Salt Lake City, Utah**

**Filed May 11, 1970, Ser. No. 36,346**
**Int. Cl. F24c *15/10***
**U.S. Cl. 126—215** **5 Claims**



A cooking grill having independently extensible leg means such that the grill may be leveled even though the supporting surface is non-horizontal or even undulating. Bottoms of the leg supports for the grill are provided with or attached to magnetic means so that the grill may be supported in a stationary manner while the legs are being adjusted for height or the grill used. Clip means are provided with the grill for accommodating mounting to conventional camper-type stoves, for example. The magnetic means of the grill prevents the same from slipping sideways over the magnetically permeable surface to which the same is attached and upon which it rests.

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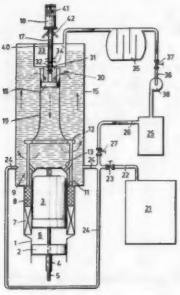
**3,651,797**
**HEATING SYSTEM**

**Johann Schroder, Aachen, Germany; Henricus Cornelis Johannes Van Beukering, and Roland Anton Johan Otto Van Witteveen, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Sept. 24, 1969, Ser. No. 860,585**
**Claims priority, application Netherlands, Sept. 30, 1968, 6813989**
**Int. Cl. F24j *1/00***
**U.S. Cl. 126—263** **8 Claims**

Heating system including a reaction vessel containing a liquid metal mixture and a reservoir containing an oxidizing agent, a supply duct including a control-cock for commu-

nicating the oxidizing agent to the vessel for an exothermic reaction with the metal, and an inert gas reservoir communicating through another duct into the supply duct. In the reaction vessel is a centrifuge, with an outlet for the inert gas in the vicinity of the rotary shaft of the centrifuge.



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**3,651,798**

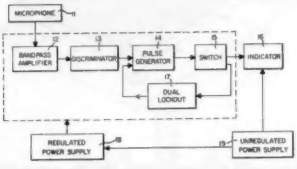
**BLOOD PRESSURE INDICATOR AND NOISE**

**Paul H. Egli, Collingswood; Warren W. Brenner, Willingboro, both of N.J., and Martin H. Wilcox, Castle Rock, Colo., assignors to Parke, Davis & Company, Detroit, Mich.**

**Filed May 15, 1970, Ser. No. 37,543**

**Int. Cl. A61b** *5/02*

**U.S. Cl. 128—2.05 S** **9 Claims**




An electronic blood pressure indicator for use with conventional inflatable arm cuff apparatus and a mercury or aneroid manometer, comprising a microphone for translation of arterial blood flow sounds into electrical signals, a narrow bandpass amplifier circuit which filters extraneous frequencies and amplifies a narrow band of low frequencies containing essential arterial blood flow information, a discriminator which senses signal strength and passes only signals exceeding a predetermined value, a pulse generator which provides a pulse output corresponding to blood flow pulses passed by the discriminator, the pulse generator cooperating with switch means to drive an indicator to provide a visual indication of the arterial blood flow sounds, and a dual lockout circuit which blocks incoming signals and spurious pulses from the pulse generator.

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**3,651,799**

**SYSTEM FOR MUTUALLY EXCLUSIVE MONITORING OF NATURAL HEARTBEAT AND PACER-STIMULATED HEARTBEAT**

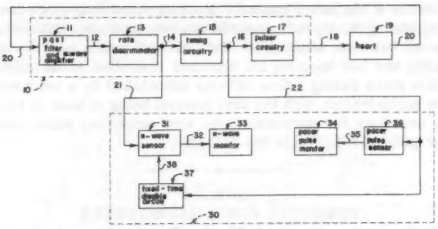
**Richard F. Daynard, Chelmsford, Mass., assignor to American Optical Corporation, Southbridge, Mass.**

**Filed May 11, 1970, Ser. No. 36,232**

**Int. Cl. A61b** *5/04*

**U.S. Cl. 128—2.06 R** **10 Claims**

A pacer and R-wave monitor system. The system includes a heartbeat detector and circuitry that distinguishes natural heartbeats from pacer-stimulated heartbeats. The system also provides an indication of which type of heartbeat occurs. Meters can be used as the indicators or monitors.

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**3,651,800**

**SURGICAL INSTRUMENT**

**James L. Wilbanks, U.S. Army Dental Detachment, Fort Lee, Va.**

**Filed May 19, 1970, Ser. No. 25,927**

**Claims priority, application Japan, May 15, 1970, 45/15403**

**Int. Cl. A61b** *1/06*

**U.S. Cl. 128—12** **7 Claims**

An elongated hand-held surgical instrument for use in intraoral lower jaw defect correcting surgery including an operative end portion for insertion within a surgical wound or incision and having an integral curved tab therein for engaging behind a ramus of a mandible and a retracting portion inwards of said end portion having opposite concave-convex surfaces for retracting the cheek and corner of the mouth during surgery with the concave surface engaging the corner of the mouth.

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**3,651,801**

**APPARATUS FOR EFFECTING MASSAGES SYNCHRONOUSLY WITH THE HEART ACTIVITY**

**Samuel Kullok, Buenos Aires, Argentina, assignor to Saul Kullok, Buenos Aires, Argentina, a part interest**

**Filed Sept. 23, 1970, Ser. No. 74,798**

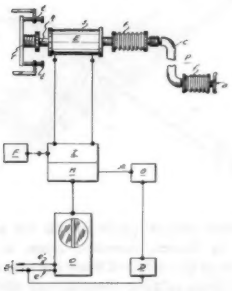
**Claims priority, application Argentina, Sept. 29, 1969, 224.374**

**Int. Cl. A61h** *7/00*

**U.S. Cl. 128—53** **10 Claims**

Apparatus for effecting massages synchronously with the heart activity, and particularly with the interphases of this activity, and comprising, in combination, a visual indicator of electrical pulses provided with two independent input channels, both connected to respective sensors applicable to the individual; a discriminator parallel-connected to one of said visual pulse-indicator units, while the output thereof is fed to

a signal generator which, in turn, is connected to at least one time marker, preferably electronic, which is connected on the one part to a third input of said visual indicator and, on



the other, to a relay device linked with a power source and with at least a massaging assembly applicable to the desired area of the body of the patient.

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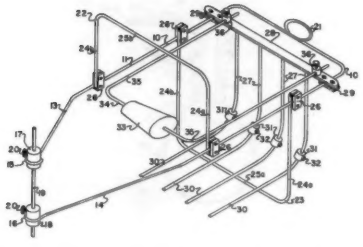
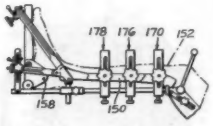
**3,651,802**
**LIMB SUPPORTING DEVICE**
**Troy R. Owens, P. O. Box 493, Hitchcock, Tex.**
**Filed Nov. 28, 1969, Ser. No. 880,637**
**Int. Cl. A61f *13/00***
**U.S. Cl. 128—82** **10 Claims**



An apparatus for supporting the hand or foot during convalescence thereof including a frame comprising two substantially parallel rods, a frame supporting member comprising rods extending in angular relation from said frame for contact with a supporting surface to thereby maintain said frame in spaced relation from said supporting surface, a holding rod connected to one end of said frame for extension through the forelimb of the patient, a plurality of substantially parallel extending bars connected to said frame adjacent the end thereof opposite said holding rod and extending from said frame in substantial angular relationship thereto, and a supporting member attached to said frame intermediate the ends thereof, said supporting member having a generally rounded upper surface for fitting into the palm of and supporting a hand or foot.

**3,651,803**
**DEVICE FOR THE TREATMENT OF FRACTURES, ESPECIALLY LEG FRACTURES**
**Rudolf Bimler, Deichstrasse 9, 279 Cuxhaven, Germany**
**Filed Nov. 4, 1969, Ser. No. 873,954**
**Claims priority, application France, Nov. 5, 1968, 172634**
**Int. Cl. A61f *5/04***
**U.S. Cl. 128—88** **5 Claims**




A jointed splint structure in which upper and lower leg portions are hinged together at the knee and a foot portion is mounted on the foot end of the lower leg portion and is adjustable axially of the lower leg portion. The foot portion includes a sandal engageable with the sole of the foot and the sandal has substantially infinite adjustment in the foot portion within predetermined limits. The lower leg portion is adapted for adjustably receiving brackets engageable with the ends of pins inserted laterally through the bone being treated so the bone is clamped to the splint structure during healing.

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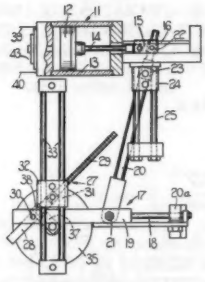
**3,651,804**
**PUMPING APPARATUS**
**Adrian Leonard Spiller, Beamsley, Royston Grove, Hatch End, England**
**Filed Dec. 3, 1969, Ser. No. 881,762**
**Claims priority, application Great Britain, Dec. 13, 1968, 59,425/68**
**Int. Cl. A62b *7/02*; F01b *9/02***
**U.S. Cl. 128—145.6** **11 Claims**



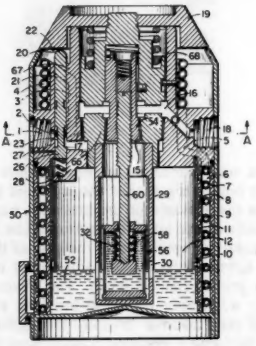
An artificial respirator including a pump assembly, a piston of which is connected to a first axially movable rod, a second axially movable rod, pivotal lever means interconnecting the rods, the pivot point of said lever means being adjustable to effect variation in the volume of gas pumped by the pump means, a second lever pivotally connected to the second rod, an adjustable fulcrum for the second lever and a rotary link operatively connected to the second lever whereby upon rotation of the link movement is imparted to the second rod, the fulcrum point of the second lever being adjustable to vary the timing of the forward and return motion of the pump means.

**3,651,805**

## ANESTHETIC VAPORIZER

**Hans Georg Breiling, Gross Gronau, Germany, assignor to Dragerwerk Aktiengesellschaft, Lubeck, Germany**

**Filed May 7, 1970, Ser. No. 35,534**
**Claims priority, application Germany, May 12, 1969, P 19 24 227.4**
**Int. Cl. A61m *17/00***
**U.S. Cl. 128—188** **1 Claim**



An anesthetic vaporizer includes a housing for the anesthetic fluid which includes an inlet passage having a connection for a first bypass flow and a second pressure compensation flow within the housing. The pressure compensation flow is through a spiral tube which leads into a chamber for the anesthetic fluid and the bypass flow is directly to the discharge of the device. The control also includes a flow control valve from the fluid chamber which provides for a flow of the fluid from the chamber to the discharge in accordance with the temperature conditions of the fluid within the chamber.

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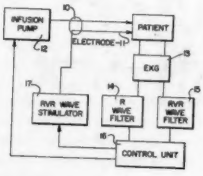
**3,651,806**

## METHOD AND APPARATUS FOR ADMINISTERING DIGITALIZING MEDICATIONS

**Philip I. Hirshberg, 43 Harris Avenue, Needham, Mass.**

**Filed Oct. 24, 1969, Ser. No. 869,136**
**Int. Cl. A61m *05/00***
**U.S. Cl. 128—214 E** **11 Claims**



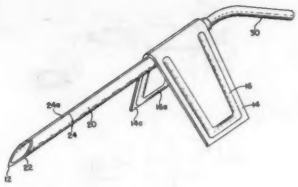

A method and apparatus for infusing digitalizing medication to a patient at a controlled rate. The apparatus including first detection means for recognizing an electrical event originating in the muscle of the heart, electrical stimulation means responsive to the electrical event for stimulating the heart with an electrical stimulating signal, second detection means for detecting an electrical signal indicative of the response of the heart to the electrical stimulating signal, and infusion means including means responsive to said last mentioned electrical signal to control the amount of medication administered to the patient.

**3,651,807**

## DETACHABLE, HOLLOW GUIDE NEEDLE

**James A. Huggins, 8501 Harris Higgins Road, Racine, Wis.**

**Filed Feb. 19, 1970, Ser. No. 12,649**
**Int. Cl. A61m *5/00***
**U.S. Cl. 128—214.4** **3 Claims**



A detachable hollow guide needle for piercing body portions, such as tissues, muscles, veins, to locate a flexible catheter tube in the selected body portion for withdrawing or introducing fluids relative thereto, and which includes a longitudinally split tube with the edges thereof normally adjacent one another to substantially enclose an included catheter tube, the tube having a sharpened end configuration for body insertion and wing members adjacent the opposite end diverging from adjacent edges of the split tube for pressure application to spread the tube edges a distance sufficient to remove the same from the body inserted catheter initially associated therewith.

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**3,651,808**

## EAR SYRINGE

**Ira C. White, 67 Washington Street, Natick, Mass.**

**Filed Nov. 10, 1969, Ser. No. 875,144**
**Int. Cl. A61m *1/00, 3/00***
**U.S. Cl. 128—232** **2 Claims**

An ear syringe comprising an integrally formed flexible bulb for receiving an irrigation fluid, a tube for discharging irrigating fluid from the bulb into an ear canal, and a receptacle for accumulating fluid and dislodged cerumen emerging from the ear canal. To facilitate positioning of the receptacle directly below the lobe of an ear being irrigated, the discharge tube is disposed above and substantially parallel to a plane defined by an open top of the receptacle.

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**3,651,809**

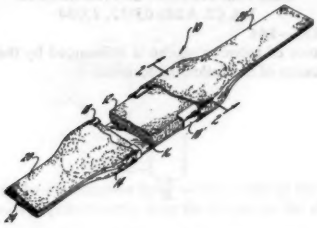
## BAFFLE FOR SANITARY PROTECTION DEVICES

**John F. Champaigne, Jr., Winnebago County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.**

**Filed Feb. 24, 1970, Ser. No. 13,458**
**Int. Cl. A61f *13/16***
**U.S. Cl. 128—290** **9 Claims**

An absorption device such as a sanitary napkin is provided with a fluid impervious baffle that may be disposed of in con-

ventional sanitary systems. The baffle comprises a thin film of a water-sensitive material which includes a water-repellent



coating on that surface of the film which comes in contact with absorbed fluid in the napkin during use.

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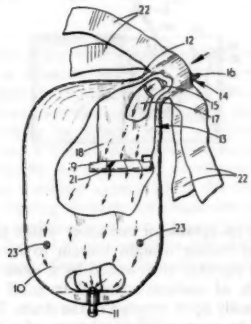
**3,651,810**
**INCONTINENCE DEVICE**
George Eric Ormerod, Carnforth, England, assignor to Eric Ormerod Limited, Morecambe, Lancashire, England
Filed Nov. 7, 1969, Ser. No. 874,893
Claims priority, application Great Britain, Nov. 11, 1968, 53,233/68
Int. Cl. A61f *5/44*
U.S. Cl. 128—295 7 Claims



An incontinence device in which a urine collecting bag is provided with a closable outlet with the entry into the urine collecting bag being through a one-way valve and the inlet to the one-way valve having a urine receiving device which may be another bag or a plastic urethra tube adapted for insertion into the vaginal passage.

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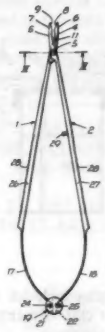
**3,651,811**
**SURGICAL CUTTING INSTRUMENT**
Hans G. Hildebrandt, Ludwigshafen, and Fritz Hilzinger, Tuttlingen, both of Germany, assignors to Aesculap-Werke Aktiengesellschaft vormals Jetter & Scheerer, Tuttlinger (Baden-Wuertemberg), Germany
Filed Oct. 10, 1969, Ser. No. 865,442
Int. Cl. A61b *17/36*
U.S. Cl. 128—303.17 12 Claims

A surgical cutting instrument that incorporates electrodes capable of coagulating or cauterizing a severed blood vessel



at the same time that it is cut.

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**3,651,812**
**ELECTROLYSIS NEEDLE**
Marvin S. Samuels, Philadelphia, Pa., assignor to Joseph S. Zuritsky; Herman Zuritsky and Lee Zuritsky, Philadelphia, Pa., part interest to each
Filed Mar. 12, 1970, Ser. No. 19,041
Int. Cl. A61b *17/40*; A61n *3/06*
U.S. Cl. 128—303.18 2 Claims

An electrolysis needle having a thin dielectric coating deposited over the entire penetrating tip portion and the lower portion of the shank of the needle and then partially removed adjacent the tip of the needle to prevent electric shock or burning of the epidermis with resultant elimination of pain to the patient.

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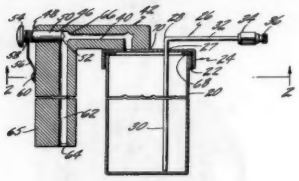
**3,651,813**
**CRYOSURGICAL DELIVERY AND APPLICATION OF LIQUEFIED GAS COOLANT**
Michael D. Bryne, Vernon, Conn., assignor to Brymill Corp., Vernon, Conn.
Original application Nov. 15, 1967, Ser. No. 683,351, Pat. No. 3,534,739. Divided and this application Oct. 8, 1969, Ser. No. 870,399
Int. Cl. A61b *17/36*; A61m *11/04*
U.S. Cl. 128—303.1 11 Claims

A self-contained, mobile, compact, untethered cryosurgical instrument is provided in which liquefied gas coolant in a

container with heat conducting walls is pressurized by ambient temperature for delivery to a lesion to be necrotized. The coolant is discharged in a controlled spray in one embodiment; the delivery tube includes a vent tube coaxially spaced therefrom in other embodiments. Freezing to tissue is overcome with "Teflon" coatings.



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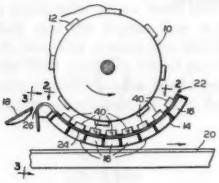
**3,651,814**

**SMALL SEED ATTACHMENT FOR THRESHERS**

**Walter J. Vander Zanden, Route 1, P.O. Box 50, Hillsboro, Oreg.**

**Filed Dec. 3, 1970, Ser. No. 94,917**
**Int. Cl. A01f** *12/28*
**U.S. Cl. 130—27 K** **11 Claims**



The attachment includes a curved plate adapted for insertion between the threshing cylinder and the concave of a thresher so as to nest within and cover the concave to prevent seeds from falling through the grate openings therein. Resilient bars bonded to the concave surface of the plate coact with the rasp bars on the cylinder to provide the threshing action.

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**3,651,815**

**SMOKABLE PRODUCTS AND A PROCESS FOR THEIR PRODUCTION**

**George Neurath, Hamburg; Jurgen Gewe, Hamburg-Niendorf, and Michael Dunger, Hamburg-Bramfeld, all of Germany, assignors to Haarmann & Reimer Gesellschaft mit beschrankter Haftung, Holzminden, Germany**

**Filed Sept. 23, 1969, Ser. No. 860,430**
**Claims priority, application Germany, Sept. 30, 1968, P 17 92 657.7**
**Int. Cl. A24b** *03/00, 15/00;* **A24d** *01/18*
**U.S. Cl. 131—2** **1 Claim**

The aroma of tobacco is improved and artificial tobacco and tobacco substitutes are given an improved tobacco aroma when smoked by treating such substances with aromatic materials extracted from vegetable chlorophyll-containing leaf material such as by use of solvents, steam distillation and the like.

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**3,651,816**

**TREATING TOBACCO**

**Georg Neurath, Eichtalstrasse 27; Michael Dunger, Kienholt 6a, both of Hamburg, and Herbert Wichern, Hazenwisch 65, Halstenbek, all of Germany**

**Filed Feb. 20, 1969, Ser. No. 801,156**
**Int. Cl. A24b** *03/12, 15/04*
**U.S. Cl. 131—144** **6 Claims**

The flavor of tobacco smoke is influenced by the addition of a substance of the following formula

in which R represents $-CH_2-CHO$, $-(CH_2)_2-CHO$, $-C-O-CHO$, $-CH_2-CO-CHO$, $-CH_2OH$, $-(CH_2)_2OH$, $-OHOH-CH_2-CH_3$, $-CO-(CH_2)_3OH$, $-CO-CHOH-CH_3$, or $-CO-COO-C_2H_5$. The added compound comprises approximately 0.001 percent to 1.0 percent by weight of the tobacco composition.

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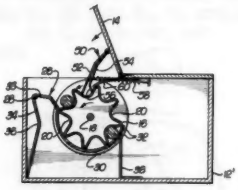
**3,651,817**

**CIGARETTE EXTINGUISHER RECEPTACLE**

**William W. Baker, 1616 East St. Louis, Las Vegas, Nev.**

**Filed Jan. 9, 1970, Ser. No. 1,710**
**Int. Cl. A24f** *19/14*
**U.S. Cl. 131—237** **3 Claims**



A cigarette receptacle or container which has a revolving drum element having troughs therein to receive a typical cigarette and partially surrounded by a close fitting curved member made of resilient material to snuff out cigarettes quickly and easily upon rotation of the drum. Rotation of the drum occurs by successive depressions of a lever pivotally mounted on the container in conjunction with a cog wheel having inclined teeth and mounted on one side of the drum or by repeated opening and closing of a pivoted closure located above the drum, the closure having depending prongs arranged to engage the periphery of the drum in ratchet fashion when the closure is opened and closed the container having a spring plate attached to the upper portion thereof adjacent to said closure, the free edge of the spring plate extending into a trough in order to prevent uncontrolled rotation of the drum.

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**3,651,818**

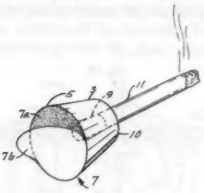
**CIGARETTE HOLDER**

**Louis M. Vargo, P.O. Box 629, Covington, La.**

**Filed Apr. 7, 1970, Ser. No. 26,249**
**Int. Cl. A24f** *13/22*
**U.S. Cl. 131—257** **4 Claims**

A cigarette holder for adhesive attachment to one's clothing comprising a body having an opening for holding a

cigarette and a surface to which is applied an adhesive coating covered by a protective layer which protects the adhesive and is removed prior to attaching the holder to the clothing.



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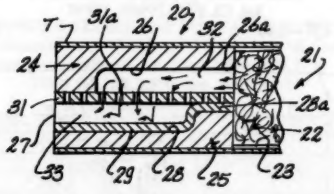
**3,651,819**
**SMOKE FILTER**

Hoyt S. Beard, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Mar. 9, 1970, Ser. No. 17,606
Int. Cl. A24d *01/04*; A24f *01/20, 13/06*
U.S. Cl. 131—261 B 10 Claims



A smoke filter is provided which is adapted to be affixed to one end of a tobacco rod. The filter includes a first passageway through which smoke initially flows, a thin perforated membrane forming one wall of the first passageway and through which the smoke flows as a plurality of high velocity jets, and a second passageway separated from said first passageway by the perforated membrane. The second passageway has a surface against which the smoke jets impinge prior to flowing through the remainder of the second passageway. A predetermined area of a surface in the second passageway is formed of an absorptive material which is contacted by the smoke flowing through the second passageway.

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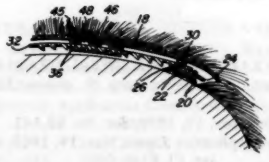
**3,651,820**
**METHOD OF SECURING A HAIRPIECE**

Ralph L. Johnson, 2400 N.W. 23rd Street, Oklahoma City, Okla., and Gary E. Clayton, Lot E6, 1100 South Rockwell, Oklahoma City, Okla.

Filed Mar. 12, 1971, Ser. No. 123,757
Int. Cl. A41g *3/00*
U.S. Cl. 132—5 10 Claims



A method is provided for holding a hairpiece firmly in place on a wearer's head by anchoring adjustable brackets to the wearer's existing hair. A firm anchor is formed from a bead of melted rubber which is fused into a thin strip of existing hair, and subsequently hardens therein. An anchor attachment and adjustable male bracket are fastened to the rubber anchor, the male bracket engaging a corresponding female bracket attached to the base of the hairpiece to firmly hold the hairpiece in place. The effective length of the male bracket may be adjusted to compensate for hair growth over a period of time.

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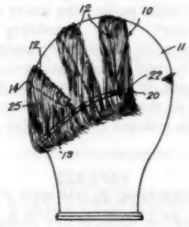
**3,651,821**
**HAIRPIECE CONSTRUCTION**

Dorothy M. Mielke, 3055 North Meridian Street, Indianapolis, Ind.

Filed Nov. 21, 1969, Ser. No. 878,862
Int. Cl. A41g *3/00*
U.S. Cl. 132—53 1 Claim



A partial hairpiece for use by people with thinning hair which consists of a plurality of hair-carrying webbed bands for placement across the top of the head in separated strips, the bands having their ends attached to an elastic band which is U-shaped and extends around the back of the head from the temples. The separation of the hair-carrying strips allows the wearer's own hair to extend through the area between the strips where it may intermingle with an overlie portions of the hairpiece hair.

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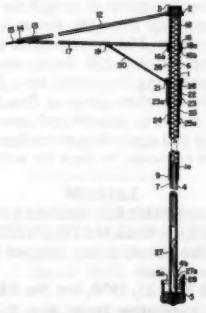
**3,651,822**
**COLLAPSIBLE AND AUTOMATICALLY OPENABLE UMBRELLA**

Hiroyuki Yasuda, Funabashi, and Choji Arai, Showa-Machi, Kitakatsushika-gun, both of Japan, assignors to Kabushiki Kaisha Ideal, Tokyo, Japan

Filed May 6, 1970, Ser. No. 35,127
Claims priority, application Japan, May 14, 1969, May 14, 1969; 44/44201, 44/44202
Int. Cl. A45b *25/14, 25/16*
U.S. Cl. 135—24 2 Claims



A collapsible umbrella automatically openable, without impact when opened, upon a mere depression of a buttoned latch means provided in the lower portion of the main shaft and requiring no overturn of rib joints when folded is ob-

tained by the arrangement comprising, in combination: a main shaft formed with a tubular outer upper shaft member having a latch-engaging slit and slidably mounted on a tubular inner lower shaft member via a compressible spring means contained in said outer shaft member; an auxiliary tubular member mounted slidably on the main shaft and extending upwardly through a ringlike intermediate member mounted on said main shaft in detachable engagement with the lower end of said auxiliary tubular member, said intermediate member carrying a spoke for slidably and pivotably supporting the main rib member of a corresponding rib via an attachment member slidably mounted on the main rib member; a tubular lower member having latch-engaging holes and supporting rod members for pivotably supporting said spokes and being slidably mounted on said main shaft; a compressible spring means mounted on the main shaft between said ringlike intermediate member and said tubular lower member and being securely retained at its lower end in said tubular lower member for pushing said intermediate member upwardly while pulling the lower member upwardly on the main shaft while providing more distance therebetween, each main rib member having an auxiliary rib member secured to said attachment and capable of being received in said main rib member to reduce the length of the corresponding rib as the inner shaft is forced to be received in the outer shaft to collapse the umbrella.

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**3,651,823**

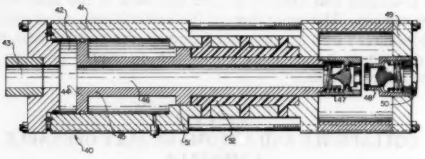
**THERMAL SENSING BLOW OUT PREVENTER ACTUATING DEVICE**

**James Leland Milsted, Sr., 537 Olive Street, Harvey, La.**

**Filed Apr. 29, 1970, Ser. No. 32,845**

**Int. Cl. E21b** *33/06;* **F16k** *17/38*

**U.S. Cl. 137—72** **7 Claims**



The present disclosure is directed to a fail safe device to close an oil or gas well that has ignited during drilling or workover operations working in conjunction with pressure accumulators and blow out preventers. The apparatus is installed in a line the upstream side of which is pressurized by the accumulators and the downstream side of which is connected to actuate the blow out preventer. The device has a pair of normally closed check valves which are spaced apart but which may be moved together to unseat the valves and permit the pressurized fluid from the accumulators to actuate the blow out preventer. The movement of the check valves by a fluid motor which while being under pressure is restrained from unseating the valves by a thermally fusible flowable barrier which when attaining flow temperature will permit the fluid motor to actuate and unseat the normally closed check valve and apply the accumulator pressure to actuate the blow out preventer to close the well.

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**3,651,824**

**APPROXIMATE IMPULSE SIGNALS PRODUCING DEVICE OF THE PNEUMATIC PRESSURE TYPE**

**Takashi Ishida, Ohi-Machi, Japan, assignor to Mikuni Kogyo Co., Ltd., Tokyo, Japan**

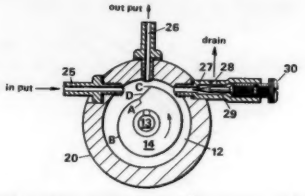
**Filed Nov. 23, 1970, Ser. No. 91,741**

**Claims priority, application Japan, Nov. 22, 1969, Oct. 23, 1970; 44/93815, 45/93372**

**Int. Cl. F15b** *5/00;* **G01p** *3/26;* **G10k** *5/00*

**U.S. Cl. 137—83** **3 Claims**

An approximate impulse signal producing device of the pneumatic pressure type comprising a casing, a rotor supported in said casing and formed on its outer peripheral surface with a surface inclined with respect to the direction of rotation of the rotor, a pressure supply duct provided in said casing for ejecting an air jet under pressure to said inclined




surface of the rotor, a drain provided in said casing in a position substantially symmetrical to the position of said pressure supply duct, and an output duct provided in said casing and disposed substantially midway between said pressure supply duct and said drain.

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**3,651,825**

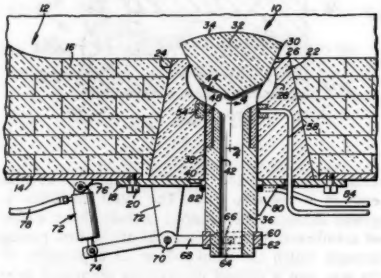
**STOPPER PLUG VALVE FOR HOT METAL LADLES**

**Francis P. Sury, P.O. Box 353, St. Clairsville, Ohio**

**Filed Oct. 24, 1969, Ser. No. 869,041**

**Int. Cl. F16c** *27/00, 33/00*

**U.S. Cl. 137—240** **5 Claims**



A valve for use in combination with the bottom of a hot metal ladle to enable molten metal to be discharged therefrom into a mold or the like with the valve being in the form of a stopper plug and including a longitudinal passage communicating with the discharge end of the valve and a transverse passage communicating with the longitudinal passage adjacent the upper end of the valve with the valve seat including a seat portion and a recessed portion communicating with the transverse passage to drain molten metal from around the valve when the valve is closed. The valve includes a sleeve of refractory material such as carbon or the like and an insert in the form of an annular band in the guide for the valve is associated with the carbon sleeve to provide for effective guiding of the valve. A supply of inert gas such as argon may be associated with the valve to prevent oxidation of the carbon sleeve and bearing ring and facilitate the sealing of the valve member.

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**3,651,826**

**DRAIN TRAP FOR HORIZONTAL DRAIN PIPE**

**Noriatsu Kojima, Yanagishima-cho 5, chome 31, Nagoya, Japan**

**Filed Nov. 10, 1970, Ser. No. 88,442**

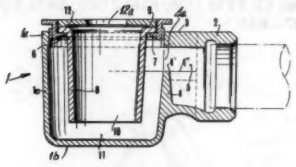
**Claims priority, application Japan, Nov. 19, 1969, 44/109187**

**Int. Cl. F16k** *9/00*

**U.S. Cl. 137—247.35** **10 Claims**

A floor drain trap for use with a horizontal drain pipe is formed of a housing with a laterally extending connection

having an outlet for attachment to the horizontal drain pipe. Extending downwardly into the housing from its upper end and spaced inwardly from its inner surface, is a frustoconically shaped inlet drain pipe section which has its lower end spaced above the bottom of the housing. The housing has an opening communicating with the drain pipe connection and



the lower edge of the opening is spaced above both the lower end of the inlet drain pipe section and the invert of the outlet to which the horizontal drain pipe is connected. Flow passes downwardly into the trap through the drain pipe section then upwardly about the outer surface of the inlet drain pipe section and over the lower edge of the opening in the housing into the connection to the horizontal drain pipe.

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**3,651,827**

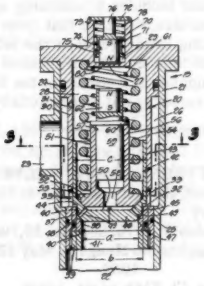
**PRESSURE RELIEF AND INDICATOR DEVICE**

**Kurt F. Hammer, and Wilbur A. Meyer, both of Camarillo, Calif., assignors to Purolator, Inc., Rahway, N.J.**

**Filed Jan. 13, 1970, Ser. No. 2,493**

**Int. Cl. F16k** *17/30*

**U.S. Cl. 137—469** **4 Claims**



A device which senses a differential pressure across a system having a high pressure side and a low pressure side and which at a predetermined pressure of pressure difference functions to bypass the flow from the high pressure to the low pressure side. There is pressure responsive means and indicator means, the indicator means functioning upon the pressure sensitive means moving in response to an increase in differential pressure.

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**3,651,828**

**HYDRAULIC BRAKE CONTROL VALVES**

**Thomas G. Lawson, Kings Road Tyseley, Birmingham, England, assignors to Girling Limited**

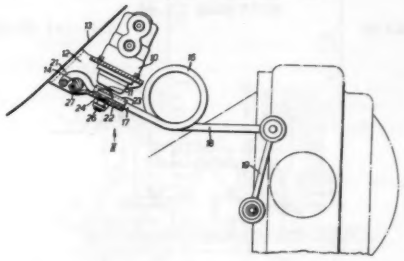
**Filed Dec. 31, 1969, Ser. No. 889,763**

**Claims priority, application Great Britain, Jan. 2, 1969, 378/69**

**Int. Cl. B66f** *9/06*

**U.S. Cl. 137—351** **8 Claims**

The invention is an improvement in vehicle brake pressure control means of the type in which a brake pressure control valve is subject to the action of a spring load, varying with changing vehicle loading conditions, which modifies the operating characteristics (pressure reducing, pressure increasing or pressure limiting) of the valve. A coil torsion



spring has opposed arms, one of which is connected to an unsprung vehicle part and the other to the sprung part. The latter arm is pivotally connected to a mounting bracket by means of a clamping member which holds the arm in rocking engagement with a fixed fulcrum.

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**3,651,829**

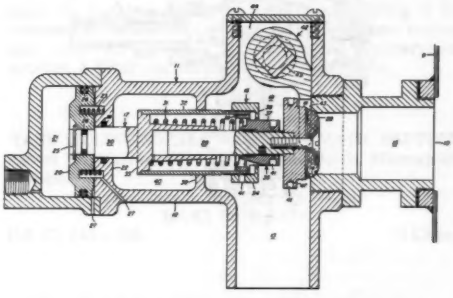
**DIESEL ENGINE COOLING SYSTEM**

**Virgil L. Frantz, Salem, Va., assignor to Graham-White Sales Corporation, Salem, Va.**

**Filed Jan. 19, 1970, Ser. No. 3,786**

**Int. Cl. F16k** *17/02*

**U.S. Cl. 137—529** **8 Claims**



An automatic dump and pressure relief valve for a pressurized engine cooling system in which both automatic dumping and pressure relief are produced by a piston reciprocable in a valve body and having operating and actuating heads responsive to fluid pressure and connected for limited relative axial movement and springs acting on the heads and yieldable to predetermined pressures applied thereto. The valve also has a manual override for enabling it to be opened as needed while the system is pressurized.

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**3,651,830**

**CAR WASH APPARATUS**

**Klaus E. Kollmai, 211 South Main Avenue, Haysville, Kans.**

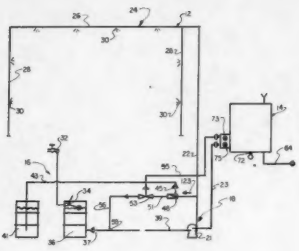
**Filed May 22, 1970, Ser. No. 39,589**

**Int. Cl. B08b** *3/00*

**U.S. Cl. 137—565** **9 Claims**

This invention is a car wash apparatus having a control panel actuated through a transmitter structure in order to control liquid supply movement to a pump and motor assembly for successively dispensing rinse and detergent solutions onto a moving vehicle from a stationary U-shaped

dispensing structure. More particularly, this invention is a car wash apparatus operable to dispense preselected liquids



therefrom while being remotely controlled by a person operating a vehicle being cleansed.

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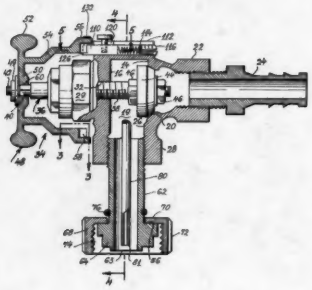
**3,651,831**
**SAFETY BLEEDER VALVE**

**Irving Gardner, Hunter, N.Y.**

**Filed Apr. 29, 1970, Ser. No. 32,916**
**Int. Cl. F16k *35/04, 45/00***
**U.S. Cl. 137—588** **9 Claims**

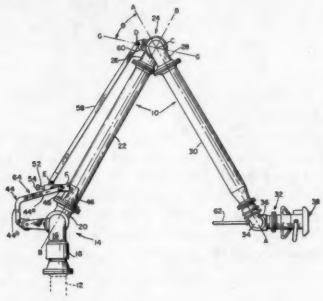


A safety bleeder valve of the globe type for propane gas delivery trucks for preventing the possibility of the accidental or unintentional opening of the valve and escape of gas from the valve when the delivery hose is off its support on the truck and detached from the tank or container being supplied with gas or opening of the valve due to vibration when the vehicle is in motion. The safety valve has end and side walls with an inlet in one end wall and an outlet in the side wall. A threaded stem slides through an opening in the other end wall. A valve head is carried on one end of the stem and adapted to seat on a seat formed in the one end wall. The other end of the stem has a hand wheel for turning the stem. Ratchet teeth on the hand wheel coact with a slidable spring pressed core mounted on the side wall for holding the wheel and stem from rotating. A rotatable ring is provided for connecting the valve body to the inlet of a tank being supplied with gas. Gas bleed means is formed on the valve body for releasing the gas pressure on the rotatable ring to facilitate breaking the connection with the inlet on the tank. Cooperating indicia on the valve body and a skirt of the hand wheel indicate relative wear of a valve head when the hand wheel is rotated to close the valve.

**3,651,832**
**ARTICULATED COUNTERBALANCED PIPING APPARATUS**

**William Meyer, East Orange, N.J., assignor to Emco Wheaton Inc., Union, N.J.**

**Continuation-in-part of application Ser. No. 866,540, Oct. 15, 1969, now abandoned. This application Sept. 24, 1970, Ser. No. 75,085**
**Int. Cl. F17d *1/08*; F16l *27/00*; B67d *5/04***
**U.S. Cl. 137—615** **17 Claims**



This application deals with a device for loading fluids such as oil into tank cars. It has an inboard and an outboard conduit pipe which are pivotally connected together. The inboard pipe connects with a supply strand pipe and the free end of the outboard conduit has a nozzle that connects with the tank car to be loaded. The invention is concerned with a balancing means for balancing the inboard and the outboard conduit members and includes a balancing spring in combination with an articulated linkage that splits the balancing force of the balancing spring between the inboard and the outboard conduits to balance both of them so that a user of the device can manipulate the nozzle on the free end of the outboard conduit member as if it is substantially weightless.

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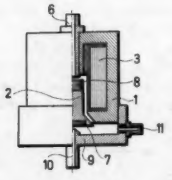
**3,651,833**
**ELECTROMAGNETIC VALVE**

**Zoltan Piko, Budapest, Hungary, assignor to Medicor Muvek, Budapest, Hungary**

**Filed May 8, 1970, Ser. No. 35,706**
**Claims priority, application Hungary, May 12, 1969, ME-1059**
**Int. Cl. F16k *11/06, 31/08***
**U.S. Cl. 137—625.65** **4 Claims**



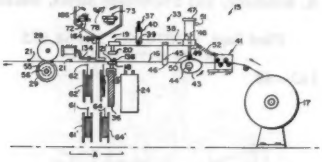
An electromagnetic valve has a valve member which is a core movable within a winding. The core remains deep in the winding and is spaced laterally from the interior of the winding and has a beveled seat where it emerges from the winding that engages with a beveled surface on the winding to locate the core in a closed position. The core has resilient valve seats at opposite ends to permit fluid switching, as in a logic circuit, with low amplitude of movement and with high sensitivity.

3,651,834

## WIRE MESH MAKING

Sam Larkin, 254 Beach 140th Street, New York, N.Y.

Filed Oct. 27, 1969, Ser. No. 869,571
Int. Cl. B21f 27/00
U.S. Cl. 140—3 R 14 Claims



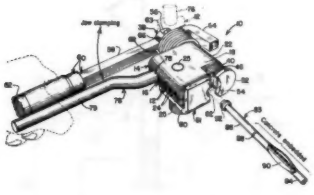
During each cycle of operation of an automatic wire mesh making machine, a transverse wire is welded to the wrap whereupon the fabric is shifted a predetermined relatively small amount to receive the next transverse wire at the welding station for repetition of the cycle. In the examples of machinery shown herein, the transverse wires are furnished by a mechanism, which, from separate supply reels during each cycle, simultaneously feeds four spaced wires across the warp, one-quarter their required length as measured from an entrance whereat, during each cycle, a different one of said four wires is severed in a predetermined sequence and let free of temporary holding means to be guided towards the welding station. In several apparatus embodiments, the cutoff means is a rotary blade cooperating in succession with the hardened steel bushings which lead the fed wires for temporary hold by clamp forms in which the wires lie loose, or along rows of magnets. In embodiments for working with wire stock heavier than three-sixteenths inch, the cutting is done by individual punches worked by a cam system, or by a traveling ram worked by a cam and an oscillating beam.

3,651,835

## TORQUE-APPLYING TOOL FOR BUTTON-HEAD CONCRETE WALL FORM TIE RODS

George J. Eriksson, Morton Grove, Ill., assignor to Superior Concrete Accessories, Inc., Franklin Park, Ill.

Filed Aug. 17, 1970, Ser. No. 64,212
Int. Cl. B21f 7/00
U.S. Cl. 140—149 12 Claims



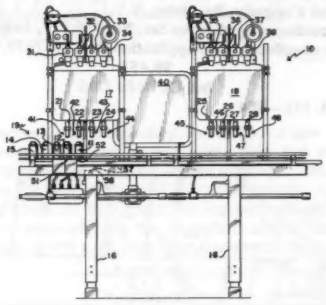
A torque-applying tool by means of which the frangible protruding ends of concrete wall form tie rods with conventional button-heads and breakbacks may be twisted from the embedded medial regions thereof. An eccentric jaw action is effective in the direction of torque-application to afford a high mechanical advantage for tie rod clamping, coupled with high torque leverage, while a spring-biasing action, coupled with an overlay flange on the clamping jaw permits one-hand manipulation of the tool.

3,651,836

## ELECTRONIC CONTROL CIRCUIT FOR A CONTAINER FILLING MACHINE

Lloyd D. Johnson, Davenport, Iowa, assignor to The Kartridge Pak Co., Davenport, Iowa

Filed Oct. 21, 1970, Ser. No. 82,623
Int. Cl. B65b 57/06
U.S. Cl. 141—103 16 Claims



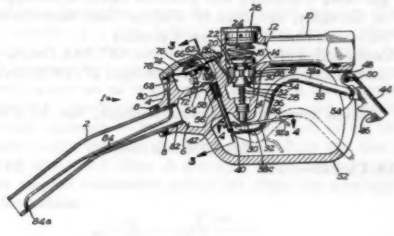
Two limit switches, one for sensing the presence of a container at a first filling station of a filling machine and one for sensing when the container has been advanced a predetermined distance through the filling machine, provide the only sensing means for controlling the filling of each container with equal amounts of fluid at four filling stations. The switches are connected to a shift register circuit which is actuated by the actuation of the switches to generate an output signal (or signals) on different leads to cause filling of the container at the first filling station and at subsequent stations each time the container is advanced a predetermined distance. A timer controls the filling at each station.

3,651,837

## TANK FILLING NOZZLE WITH AUTOMATIC SHUTOFF

Robert W. Murray, 8000-29th Avenue North, Minneapolis, Minn.

Filed June 8, 1970, Ser. No. 44,101
Int. Cl. B67d 5/373
U.S. Cl. 141—128 11 Claims



A fluid dispensing nozzle incorporating an automatic shutoff mechanism responsive to the filling of a receiving tank to a level near its top is provided with mechanical means operable independently of the automatic shutoff mechanism to open a flow passage through the nozzle to permit the complete filling of a receiving tank after the shutoff mechanism has been actuated. The shutoff mechanism includes a movable, pressure-sensitive member which is displaced by a pressure differential created thereon in response

to the substantial filling of a receiving tank to pivot a latch out of restraining engagement with a roller on a slide rod normally serving to hold a valve in the nozzle open. The releasing of the latch from the roller causes the slide rod to be shifted by valve spring pressure to close the nozzle valve.

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**3,651,838**

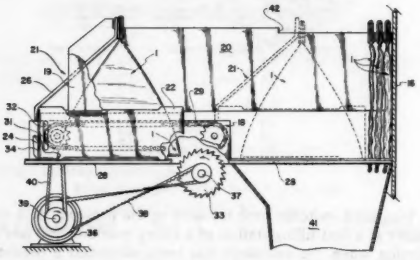
## LOADING MECHANISM IMPROVEMENT

**Donald J. Albert, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Continuation of application Ser. No. 756,517, Aug. 30, 1968, now abandoned. This application Dec. 15, 1970, Ser. No. 98,451**

**Int. Cl. B65b** *3/06*

**U.S. Cl. 141—284** **13 Claims**



A mechanism is disclosed for handling a bag for electrographic toner, which bag is shaped with closed elongated opposite ends running transverse to each other, one such end having secured thereto a rigid member having portions overlapping the bag. The bag is received by a loading mechanism having a pair of rails for supporting the overlapping portions of the rigid member and a saw for rupturing a lower portion of the bag as the bag is moved by a pusher along the rails. The pusher moves the bag from a receiving position to a position over a toner reservoir where the bag is emptied and stored with other used bags until removed fro disposal. The bag is inserted into the receiving position through an opening which is shaped to assure proper orientation of the bag in the mechanism.

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**3,651,839**

## PORTABLE MOTOR SAW

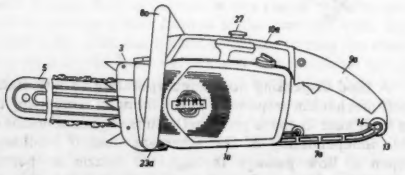
**Andreas Stihl, Rohrbronn, Am Kirschberg; Ewald Abt, Stuttgart-Bad Gannstatt, and Albrecht Rauh, Kleinheppach, all of Germany, assignors to Andreas Stihl Muschinenfabrik, Neustadt, near Waiblingen, Germany**

**Continuation of application Ser. No. 687,703, Dec. 4, 1967, now abandoned. This application Apr. 27, 1970, Ser. No. 29,763**

**Claims priority, application Germany, Nov. 24, 1967, St #26197**

**Int. Cl. B27b** *17/02*

**U.S. Cl. 143—32 R** **24 Claims**



A portable motor saw having a housing, front and rear handle means and frame means rigidly interconnecting said housing and rear handle means in spaced relationship, said frame means when seen in plan view having a contour substantially corresponding to the contour of said housing, while a plurality of elastic vibration damping means is interposed between said housing and said handle means.

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**3,651,840**

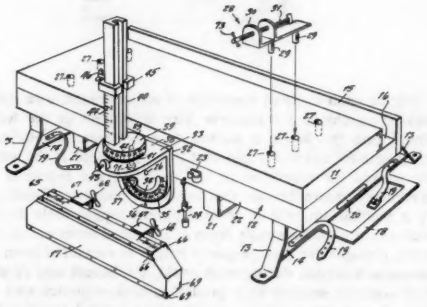
## MULTI OR COMPOUND CUTTING MITER BOX

**Charles A. Ridenour, 183 Pocatontos Street, Buchannon, W. Va.**

**Filed Sept. 1, 1970, Ser. No. 68,675**

**Int. Cl. B27b** *27/06*

**U.S. Cl. 143—88** **8 Claims**



A miter box for cutting multiple or compound angles, the device incorporating a construction whereby full angular adjustment is possible in all three planes, the device incorporating a table supporting a pivotable bracket about a first plane, the bracket supporting a tool post pivotable about a second plane, the tool post supporting a saw head holder pivotable about a third plane so to provide universal full adjustment.

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**3,651,841**

## SAW TOOTH

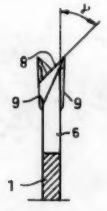
**Olof Axel Ohlsson, Rindagatan 16, Stockholm, Sweden**

**Filed Sept. 9, 1968, Ser. No. 758,488**

**Claims priority, application Sweden, Sept. 22, 1967, 13,084/67**

**Int. Cl. B27b** *33/02*

**U.S. Cl. 143—133 R** **2 Claims**



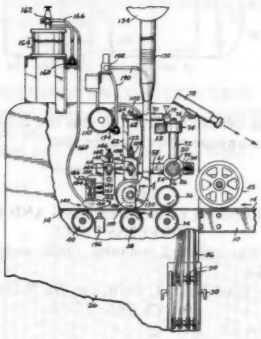
A saw tooth intended primarily for sawing wood, particularly in one direction of movement, and having a tip which is given an increased thickness in relation to the remainder of the tooth by upsetting or some other method, and bevelled surfaces so arranged that they form one or more oblique cutting edges presenting a clearance angle. The cutting edge or each of the cutting edges is formed by the intersecting line between a bevelled surface on an upper surface on the tooth and an under surface on said tooth. The bevel angle is at least 27° and at most 60°.

3,651,842

## APPARATUS FOR GROOVING PANEL SURFACES

Daniel M. McLean, Independence, Oreg., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Jan. 28, 1970, Ser. No. 6,472
Int. Cl. B27f 1/02
U.S. Cl. 144—136 R 6 Claims



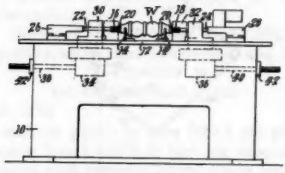
Apparatus for grooving panel surfaces along laterally spaced lines comprises a plurality of grooving cutters and mounting means mounting the cutters side by side for lateral adjustment. Adjusting means is connected to the cutters for adjusting their lateral position. An indicator is mounted on each cutter. It is operable to indicate on the surface of a panel in feed position, the position of the cutter with reference to the lines on the panel. The adjusting means thereupon adjusts the cutters to align them with the lines so that the grooves are cut along the lines as the panel is fed to the cutters. Paint applying or striping apparatus cooperates with the cutters in applying paint to the grooves as they are cut.

3,651,843

## TENON FLUTING MACHINE

Dexter H. MacQueston, Winchendon, Mass., assignor to Goodspeed Machine Company, Winchendon, Mass.

Filed Oct. 8, 1970, Ser. No. 79,061
Int. Cl. B27f 1/10
U.S. Cl. 144—198 R 15 Claims



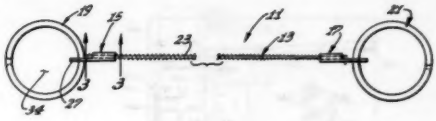
Fluting either single or double-end wooden tenons (and dowels) with small equal generally V-shaped parallel and contiguous longitudinally and circumferentially arranged flutes, by compressing the tenon with a longitudinal motion in a circular die, and including a retractable lead-in to center the work and to provide that the die travels the entire distance of the tenon or dowel.

3,651,844

## ALL PURPOSE SAW

Terry B. C. Barnes, 31063 2nd Avenue, So. Laguna, Calif.

Filed Feb. 24, 1970, Ser. No. 13,334
Int. Cl. B27b 21/00, 33/16
U.S. Cl. 145—31 8 Claims



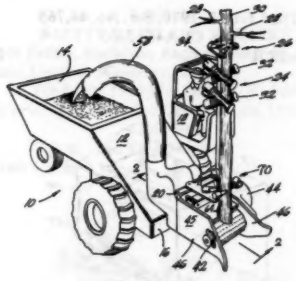
An all purpose saw comprising an elongated saw blade having a generally helical cutting tooth, first and second gripping elements, and first and second connector members for attaching the first and second gripping elements, respectively, to the blade. At least one of the connector members at least partially circumscribes the blade and coacts with the helical tooth to attach such connector member to the blade.

3,651,845

## METHOD AND APPARATUS FOR CONVERTING TREES INTO WOOD CHIPS

Robert L. Propst, 2347 Londonderry Avenue, Ann Arbor, Mich.

Filed May 25, 1970, Ser. No. 40,998
Int. Cl. A01g 23/02
U.S. Cl. 144—3 D 2 Claims



The method and apparatus for converting small trees into wood chips suitable for use in the pulp wood industry comprising combining a tree felling mechanism and a chipper mechanism in a single vehicle. The chipper mechanism consists of a rotatable toothed member movable into engagement with a tree so as to sever the tree and a tree gripping and feeding mechanism disposed above the chipper mechanism operates to continuously feed the felled tree downwardly into the chipper mechanism where the tree is converted into wood chips. A conveyor assembly associated with the chipper mechanism moves the chips into a receptacle on the vehicle.

3,651,846

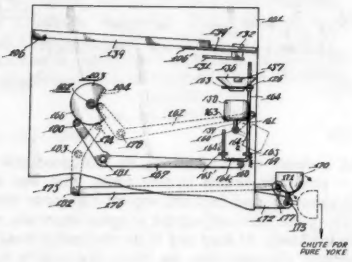
## AUTOMATIC HEN'S EGG PROCESSING APPARATUS

Masao Mirara, Yokohama, Japan, assignor to Kabushiki Kaisha Sango, Yokohama, Kanagawa, Japan

Filed Mar. 5, 1970, Ser. No. 16,893
Claims priority, application Japan, Oct. 31, 1969, 44/87420
Int. Cl. A47j 43/13
U.S. Cl. 146—2 C 2 Claims

An automatic hen's egg processing apparatus which comprises a framework; a cam shaft journaled in said framework

and having an egg feeder actuating cam, a hammer blade opening and closing cam and a hammer blade driving cam; an egg feeder having an actuating bar; an egg receiving section adapted to open sideways in opposite directions; an egg holding down member having an actuating bar; a hammer




having blades adapted to move toward and away from each other and vertically in unison; and a link mechanism operably related to the various cams and their related operation bars for performing a processing operation on one egg at one time.

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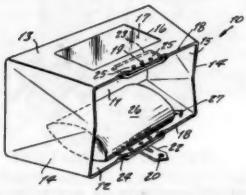
**3,651,847**
**MINI-BRELLA**
**Carole C. Casamassima, 109 Haddon Avenue, Collingswood, N.J.**
**Filed June 9, 1970, Ser. No. 44,765**
**Int. Cl. A45c** *3/00*
**U.S. Cl. 150—28 R** **2 Claims**



A device readily convertible between a beach bag and a sun-shading canopy for a bather, the device comprising a handgrip-type luggage which when opened assumes a boxlike configuration into which a person may insert his head while resting on a beach, the device including a window of sun ray filtering material and containing an inflatable pillow on which the person may rest his head.

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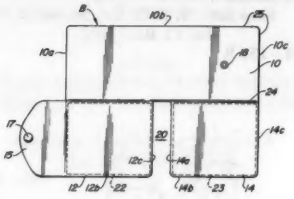
**3,651,848**
**BILLFOLD CONSTRUCTION**
**Jacob S. Tucker, 4421 Granada Boulevard Apt. 322, Warrensville Heights, Ohio**
**Filed June 1, 1970, Ser. No. 41,813**
**Int. Cl. A45c** *1/00*
**U.S. Cl. 150—38** **3 Claims**

A billfold having a bill compartment open at both ends. When the billfold is closed one open end of the bill compartment is closed by a flap without binding the edges tightly. The remaining end is left open. Extra clearance is provided in the bill compartment at the fold of the billfold. A single desired bill may be withdrawn without disturbing its fellows



and while the billfold is closed so that the contents need not be exposed to anyone other than the user.

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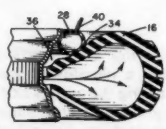
**3,651,849**
**BEAD EXPANDER FOR MOUNTING AND INFLATING TUBELESS TIRES**
**Anthony F. Kaminskas, Lyndhurst, Ohio, assignor to Clevite Corporation**
**Filed Jan. 23, 1970, Ser. No. 5,298**
**Int. Cl. B60c** *25/12*
**U.S. Cl. 157—1.1** **3 Claims**



A device for mounting and inflating a tubeless tire on an automotive wheel rim. An inflatable annular member of tubular cross section is placed between the flanged rim of the wheel and the sidewall of the tire to establish a sealed air chamber after the annular member has been inflated. Upon initial inflating of the tire, the annular member rolls off from between the rim and the sidewall.

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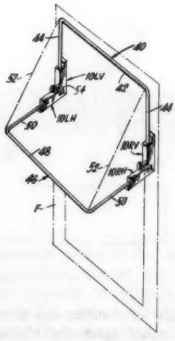
**3,651,850**
**AWNING DEVICE**
**Richmond Raymond, 45-45 162nd Street, Flushing, N.Y.**
**Filed June 15, 1970, Ser. No. 46,083**
**Int. Cl. E04f** *10/10*
**U.S. Cl. 160—77** **8 Claims**



Two pairs of brackets are used to removably support an awning in sun shielding relationship with a window. The four brackets comprising the two pairs are identical. One bracket

in each pair is secured to the window frame and the other of each pair of brackets is adjustably secured to the first of each pair of brackets. The awning itself includes a frame comprising two U-shaped rods. The ends of one of the U-shaped rods are received in suitably sized apertures in the brackets that are secured to the window frame. The ends of the second U-shaped rods are suitably secured in apertures in the other one of each pair of brackets.

The aforementioned abstract is neither intended to define the invention of the application which, of course, is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

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**3,651,851**

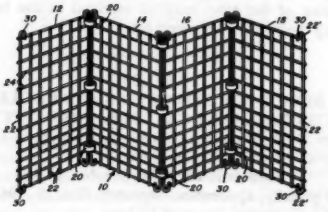
**FOLDING PEN CONSTRUCTION**

**Charles E. Curtis, Cave Springs, Ark., assignor to Curtis Chick Service, Inc.**

**Filed July 21, 1970, Ser. No. 56,857**

**Int. Cl. A47g** *5/00*

**U.S. Cl. 160—135** **3 Claims**



A folding wall assembly comprising a plurality of upright panel sections disposed in edge-to-edge relation and pivotally secured together along adjacent upstanding edge portions for relative horizontal swinging. The panel sections include upstanding rod portions defining the adjacent edge portions thereof and the latter are pivotally secured together by means of vertically spaced sleeve members through which both corresponding rod portions of the adjacent panels are loosely received. Each panel section is defined by a plurality of side-by-side upstanding rod members interconnected by a plurality of vertically spaced generally horizontal rod members crossing and secured to the vertical members and the corner portions of the panel sections are reinforced by vertical extensions of the vertical edge defining rod bent approximately 180° inwardly and back upon themselves and anchored to the adjacent horizontal rod member end portion.

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**3,651,852**

**RUFFLED BLIND CONSTRUCTION**

**Louis Neri, Aadorf, Switzerland, assignor to Griesser AG, Aadorf, Switzerland**

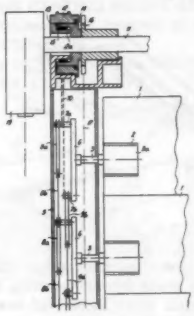
**Filed Aug. 10, 1970, Ser. No. 62,392**

**Claims priority, application Switzerland, Aug. 25, 1969, 12949/69**

**Int. Cl. E06b** *9/30, 9/302*

**U.S. Cl. 160—172** **5 Claims**

A blind includes panels or slats which are pivotally supported on cross levers which in turn are supported at their respective outer ends between sets of toggle levers with two pivotally connected toggle levers being located between each adjacent pair of cross levers on each end thereof. A pulling member comprises an endless band or chain which is directed over an upper driving wheel carried on the pullup shaft and may also advantageously be directed around the bottom guide wheel mounted in the blind housing. The pulling member is connected by a driver with the end journal of the lowermost blind panel so that when it is moved, it may raise or lower the complete set of blind panels. The toggle members which connect one end of the cross levers is connected through a chain which extends over the upper driving wheel and connects to the toggle levers on the opposite ends of the cross levers. The toggle levers form toggle joints which can be bent out in the same direction with parallel guidance



of the cross levers and the pullup shaft is advantageously rotated by a driving mechanism to simultaneously shift the front and rear set of toggle levers for the purpose of orienting the cross levers and the associated blind panels between substantially horizontal open positions or substantially vertical close positions.

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**3,651,853**

**SAFETY RAILS AND THE LIKE**

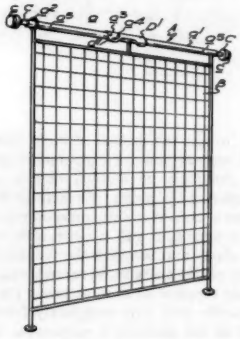
**John David Pedley, Rochdale, England, assignor to Hopkins & Buckland Limited, Middleton, England**

**Filed Oct. 19, 1970, Ser. No. 81,954**

**Claims priority, application Great Britain, Oct. 28, 1969, 52,650/69**

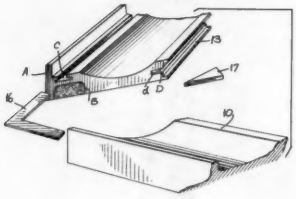
**Int. Cl. E06b** *9/02*

**U.S. Cl. 160—216** **3 Claims**



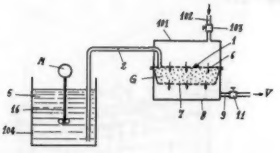
A safety rail, guard or barrier held in position between two parallel supports by two in-line tubular members connected together by a tube affixed by a pin to the stationary member of the pair, the pin moving in an arcuate slot in a handle pivoted by a pin to the movable member and moving in a slot in the tube on operation of the handle to expand or retract the members.

3,651,854
CANVAS STRETCHER
Frederick Terna, 444 East 89th Street, New York, N.Y.
Continuation of application Ser. No. 792,244, Jan. 21, 1969, now abandoned.
This application Apr. 13, 1970, Ser. No. 28,187
Int. Cl. B44d 3/18
U.S. Cl. 160—374.1 6 Claims



A stretcher for canvas or other flexible material, the stretcher being made by miter-cutting a profiled strip into four pieces which, when assembled into a frame, have the desired stretcher dimensions. The strip, preferably fabricated of lightweight metal or plastic of high structural strength, has a uniform cross-sectional profile which defines a flat outer edge, a channel fillable with a compound for accepting and retaining tacks to secure the canvas thereto, a slot for accommodating right angle irons to interconnect the pieces and a key groove to receive wedges as well as reinforcing cross bars.

3,651,855
CONTINUOUS SLURRY SUPPLY METHOD FOR FABRICATION OF MOLD LININGS
Henri Jean Daussan, rue du Fort, Longeville-les-Metz, France
Filed Feb. 10, 1969, Ser. No. 798,035
Claims priority, application France, Feb. 23, 1968, 141036
Int. Cl. B22c 15/22; B28b 1/26
U.S. Cl. 164—7 1 Claim



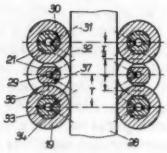
A method for the fabrication of mold linings such as hot tops and hot top sections for ingot-molds and similar lining elements in the form of molded objects which are subsequently hardened by drying, characterized in that a slurry under pressure is conveyed into a closed mold having a cavity in which at least one wall is permeable to the dispersing phase of the slurry and in which the volume of said cavity is similar to that of the lining to be reproduced, that said slurry is continuously supplied so as to maintain the maximum level within said cavity until it is completely filled with the sediment formed by the material in suspension in the slurry and that the lining thus formed is dried-out then removed from the mold.

The invention includes also a device for carrying out the method above explained, said device being characterized in that it comprises a closed and demountable mold and a mold cavity having at least one wall which is permeable to the dispersing phase of the slurry and a system for supplying slurry under pressure to said mold. The mold comprises two superposable flask sections each fitted with a half-shell which is at least partially permeable to the dispersing phase of the slurry and a chamber which can be fixed on the large free face of one of the two flask sections and which is connected to a compressed air or vacuum source.

3,651,856
METHOD OF CONTINUOUSLY CASTING STEEL
Erik Allan Olsson, Rothfluhstr. 15, 8702 Zollikon, Switzerland
Continuation-in-part of application Ser. No. 630,141, Apr. 11, 1967, now abandoned , Continuation of application Ser. No. 370,067, May 25, 1964, now abandoned. This application May 1, 1970, Ser. No. 33,959
Claims priority, application Sweden, May 30, 1963, 6014/63
Int. Cl. B22d 11/10
U.S. Cl. 164—82 4 Claims

The quantity of the continuous casting line equipment necessary to handle a large capacity furnace charge of steel is greatly reduced by dividing the furnace charge into a number of ladles which are successively poured through the casting line equipment while holding the ladles awaiting pouring for times greatly exceeding normal holding times. In this way, processing of the steel may be effected in the ladles, thus reducing the furnace charging time.

3,651,857
DEVICE FOR SUPPORTING AND COOLING CONTINUOUSLY CAST STRANDS OF METAL
Wilhelm Koch, Duisburg, Germany, assignor to Demag Aktiengesellschaft, Duisburg, Germany
Filed June 29, 1970, Ser. No. 50,465
Claims priority, application Germany, Oct. 18, 1969, P 19 52 633.1
Int. Cl. B22d 11/12
U.S. Cl. 164—283 10 Claims

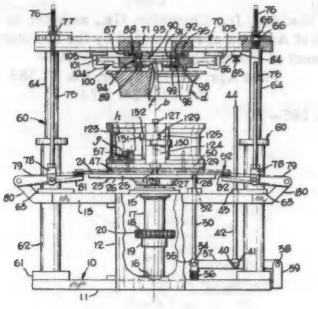


A supporting device for supporting cast strands of metal as they are fed from a casting mold, comprises a supporting frame which is adapted to be positioned adjacent the casting mold and which carries a plurality of longitudinally spaced rows of transversely extending cross members. Each cross member carries a plurality of supporting members in the form a rotatable rolls which are arranged in transversely spaced orientation with the supporting members of adjacent rows being laterally offset and extending between the adjacent support members of each next adjacent row. The supporting members are dimensioned as small as possible and the cross member advantageously includes means for directing a fluid spray outwardly in a pattern to provide adequate cooling for the casting which is supported on the device.

3,651,858
CENTRIFUGAL CASTING MACHINE
Charles A. Muench, Chesterfield, Mo., assignor to Forecast, Inc., St. Louis, Mo.
Filed Feb. 12, 1970, Ser. No. 10,809
Int. Cl. B22d 13/00
U.S. Cl. 164—286 15 Claims

A centrifugal casting machine utilizes permanent molds. Lower mold parts are mounted on a powered turntable, and upper mold parts are mounted on a member rotatable about the retainer of a thrust bearing, beneath a beam spanning the turntable. The beam is drawn downward by a pair of actua-

tors, to close the molds. Openings in the beam, bearing, and suspended member, all aligned with the turntable axis, permit pouring the molten metal while the turntable is rotating, to be forced outward by centrifugal pressure and fill the mold parts held sealed by thrust of the beam exerted through the bearing. To remove a casting, the turntable is latched in a predetermined angular position and the actuators raise the beam which hooks and lifts up on larger radius edge portions



of the upper mold part mounting member, detaining it in angular alignment. When the beam reaches its uppermost position, an ejection plate, mounted on the turntable beneath the lower mold parts is lifted to eject a casting. The upper mold part mounting member may be removed downward from the bearing retainer to change such mold parts, by manually turning it until its larger radius edge portions clear the hooks beneath the beam.

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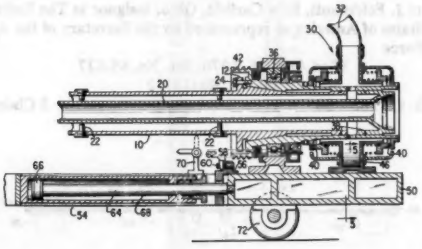
**3,651,859**

## APPARATUS FOR CENTRIFUGAL CASTING OF TUBULAR OBJECTS

**Hans Heinz Wahl; Alfons Guminski, both of Amberg, and Gunther Lohmann, Eglsee, all of Germany, assignors to Luitpoldhutte Aktiengesellschaft, Amberg, Germany**

**Filed Mar. 21, 1969, Ser. No. 826,039**
**Claims priority, application Germany, Mar. 22, 1968, P 17 58 026.6**
**Int. Cl. B22d *13/10***
**U.S. Cl. 164—291** **4 Claims**



In a conventional de Levaud centrifugal pipe casting machine which includes a rotatable water casing, a mold within the casing and rotatable therewith, cooling water supply and discharge system, ball bearings rotatably supporting the water casing, sealing glands, and means through which rotation of the water casing is effected, the improvement comprising casing sleeves mounted exteriorly at each end of the water casing which support casting machine parts such as cooling water supply and discharge system, ball bearings, sealing glands, etc., and are detachably secured to the water casing for rotation. When it is desired to remove the water casing from the casting machine, the casing sleeves are detached and moved apart to present the water casing free of the auxiliary machine parts.

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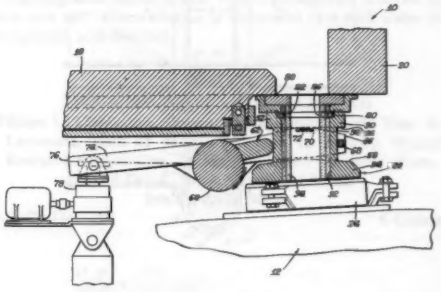
**3,651,860**

## APPARATUS FOR CASTING METAL ARTICLES

**Arthur W. Ebeling, Elmhurst, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.**

**Filed July 18, 1966, Ser. No. 565,912**
**Int. Cl. B22d *37/00***
**U.S. Cl. 164—339** **3 Claims**



A mold having a bottom opening is secured to a car that is movable to and from a pouring tube that is engaged with a ladle of molten metal. The bottom opening and pouring tube are fluidly communicable through an ingate assembly that may be pivoted into airtight engagement with the mold assembly and lowered onto the pouring tube. After molten metal is passed into the mold through the ingate assembly and solidifies, the ingate assembly may be pivoted away from the mold assembly thereby breaking the metal in the ingate assembly away from the metal in the bottom opening.

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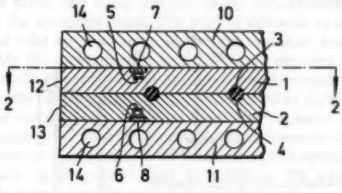
**3,651,861**

## MOLD AND METHOD

**Hans Deuring, Burscheid, Germany, assignor to Goetzewerke Friedrich Goetze Aktiengesellschaft, Burscheid, Germany**

**Filed Jan. 15, 1970, Ser. No. 3,093**
**Int. Cl. F28d *15/00***
**U.S. Cl. 165—1** **15 Claims**




A compression mold having in its walls conduits containing sponge material and a substance wetting said sponge material. This equalizes the temperatures occurring in the mold and prevents the buildup of heat at internally situated parts of the mold.

A method of using conduits of the above-described type, which method involves placing such conduits in the walls of a mold, so that heat buildup and nonuniform temperatures in the mold are avoided.

3,651,862

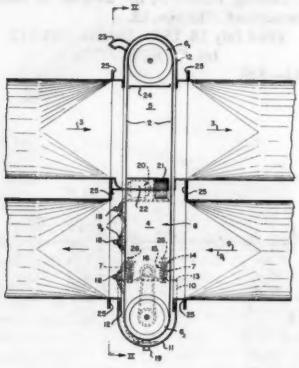
## MECHANICAL HEAT EXCHANGING APPARATUS

Robert G. Ballinger, 604 Browns Lane, Ross Township, Allegheny County, Pa.

Continuation-in-part of application Ser. No. 782,130, Dec. 9, 1968. This application Apr. 11, 1969, Ser. No. 825,090

Int. Cl. F28d *19/00*

U.S. Cl. 165—5 2 Claims



Apparatus for cooling a stream of gas having a temperature of about 2,000° F. by mechanical means. An endless metal curtain of simple construction moves at relatively high speed over and between pulley means transverse of the gas stream, and extends into a cooling enclosure. Stretching means are provided to keep the metal curtain under substantially constant tension at any possible temperature encountered, and purging means are provided to insure that the metal curtain is cleaned without contaminating the coolant. I prefer that the pulley means be driven by a variable speed power means which is controlled by a temperature sensing device positioned in the gas downstream so that the gas stream from the apparatus is cooled to a substantially constant temperature.

3,651,863

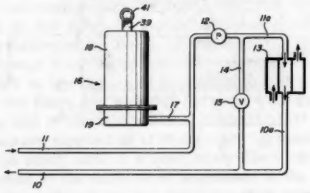
## DIFFERENTIATOR IN A COOLING SYSTEM

Paul R. Hughes, Englewood, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed June 18, 1970, Ser. No. 47,268

Int. Cl. F25b *45/00*

U.S. Cl. 165—11 3 Claims



A differentiator device used in a system circulating a liquid coolant, in which a biased pressure applying member moves to reflect changing temperature induced density of the coolant. A temperature scale is attached to the piston and is in such relative projecting relation to the device that temperature graduations thereon may be read by reference to a portion of the device. The amount of expansion volume may be visually indicated and may be simultaneously compared with an amount proper for the existing ambient temperature. Further, the scale is constructed for manipulation by which the pressure applying member may be preset in charging or filling the system, whereby to insure a properly charged system operative over the complete temperature range.

3,651,864

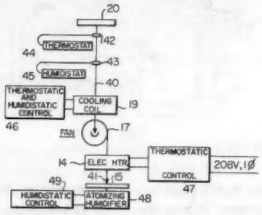
## COMPACT ROOM SIZE ENVIRONMENTAL CONTROL UNIT

Carl I. Maddox, Jr., Chamblee, Ga., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare

Filed Apr. 10, 1970, Ser. No. 27,385

Int. Cl. F24f *3/14*

U.S. Cl. 165—20 3 Claims




A self contained compact room air conditioning unit has means for automatically controlling temperature and humidity for both heating and cooling cycles. The unit rapidly conforms to preset temperature and humidity by means of continuously operable control devices selectively actuating cooler, humidifier and heater means. Air is continually circulated through the unit between spaced heater and cooler grills. Such features are provided as variable capacity heater means and a dehumidification cycle by the cooler with provisions for increasing the heater capacity to compensate for cooling if dehumidification is called for when heating the room.

3,651,865

## COOLED ELECTRONIC EQUIPMENT MOUNTING PLATE

Carl J. Feldmanis, New Carlisle, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed Aug. 21, 1970, Ser. No. 65,827

Int. Cl. H01l *1/12*

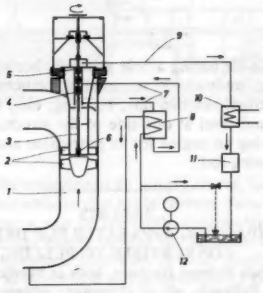
U.S. Cl. 165—80 3 Claims

An electronic equipment mounting plate has capillary type heat pipes secured thereto. A condenser section is provided near the center of the plate with a coolant being passed through cooling tubes positioned adjacent the central portion of the heat pipes to provide a heat sink. In one embodiment temperature control is provided by means of a noncondensable gas and a closed end tube within the heat pipe passages adjacent the heat sink.

## 3,651,866
## LIQUID COOLANT INSTALLATION FOR A NUCLEAR REACTOR

**Johann Lileg, and Kurt Reif, both of Graz, Austria, assignors to Maschinenfabrik Aktiengesellschaft, Graz-Andritz, Austria**

**Filed July 18, 1969, Ser. No. 842,891**
**Claims priority, application Austria, July 30, 1968, A 7396/68**
**Int. Cl. F28f** *19/00*
**U.S. Cl. 165—107** **6 Claims**

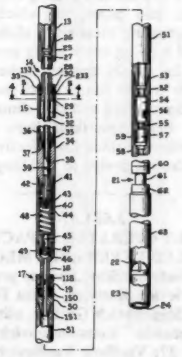


A main pump is incorporated in a liquid coolant circulation system. A drive shaft extends from said main pump and is operable to cause said main pump to circulate liquid coolant in said system. A shaft seal surrounds said shaft and is arranged to permit liquid to leak from said system when said liquid coolant circulates therein. A purifier unit is adapted to receive said leakage liquid and to purify the same by removing solid particles therefrom and to discharge purified leakage liquid to said circulation system.

## 3,651,867
## COMBINATION WELL CLEAN-OUT TOOL AND JAR

**August B. Baumstimler, 2612 East 21st, Odessa, Tex.**

**Filed Oct. 5, 1970, Ser. No. 77,920**
**Int. Cl. E21b** *31/08*
**U.S. Cl. 166—99** **9 Claims**



A well cleanout tool for retrieving junk or debris from the bottom of a borehole. The tool may be run into an oil well on the end of a wire line or sand line. Included within the tool are various chambers for retrieving or holding junk which flows thereinto when a valve is actuated. A combination valve actuator and jar mechanism is manipulated by the wire line and facilitates removal of the tool from the borehole when it becomes stuck therein. An improved releaf valve in the form of a resilient one-way check valve progressively reduces the internal pressure of the tool after it has been actuated and is traveling uphole. A second jar mechanism is optionally provided at the lower extremity of the tool.

## 3,651,868
## REMOVAL OF CALCIUM SULFATE DEPOSITS

**Danny D. Caudle, and Bobbie L. Carlberg, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.**

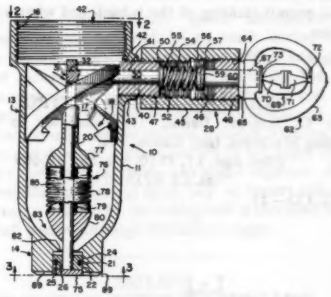
**Filed July 29, 1970, Ser. No. 59,335**
**Int. Cl. B08b** *3/08*; **E21b** *43/27, 43/28*
**U.S. Cl. 166—307** **7 Claims**

A method of removing calcium sulfate deposits comprising contacting such deposits first with a pressurized solution of ammonia and carbon dioxide in water and next with water or an aqueous acid solution.

## 3,651,869
## FIRE-RESPONSIVE SPRINKLER HEAD

**William L. Livingston, Sharon, and Sebastian David Tine, St. Lawrence, both of Mass., assignors to Factory Mutual Research Corporation, Boston-Providence Turnpike, Mass.**

**Filed Oct. 8, 1969, Ser. No. 864,756**
**Int. Cl. A62c** *37/08*
**U.S. Cl. 169—38** **6 Claims**



A fire extinguishing sprinkler head for use with a wide range of extinguishants, such as water and hydrolized ablative gel, which has an expellable plug retained in a discharge opening in the sprinkler head by fire-responsive release means. Upon actuation of the release means, the plug is expelled from the sprinkler head by the pressure of the extinguishant to clear the discharge opening of obstacles which could affect the spray pattern of the extinguishant emitted from the sprinkler head. The plug is released at a predetermined inlet head pressure so that the sprinkler head will not provide the extinguishant to the fire at a pressure which will materially affect the spray pattern from the sprinkler head or adversely influence the spray pattern of other sprinkler heads in the system. The sprinkler head also includes means for modulating the flow of extinguishant in response to the inlet pressure of the extinguishant to retain a predetermined extinguishant spray pattern and to maintain the extinguishant supply pressure to the system at a higher level.

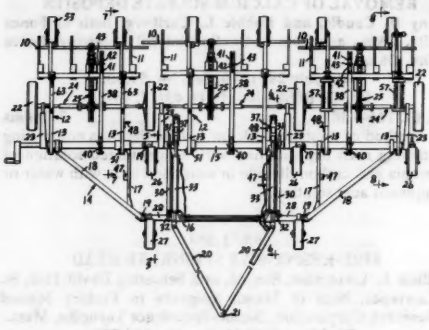
## 3,651,870
## ROD WEEDER

**Oscar C. Calkins, Spokane, Wash., assignor to Calkins Manufacturing Company, Spokane, Wash.**

**Filed Apr. 18, 1969, Ser. No. 817,408**
**Int. Cl. A01b** *39/19, 49/00, 63/00*
**U.S. Cl. 172—44** **13 Claims**

A rod weeder utilizing a floating frame by which the weeder rod is permitted to freely move about a transverse

pivot on a rigid framework or hitch. In one embodiment, elevational control is provided for raising or lowering the pivotal axis of the weeder rod frame relative to the ground to vary the inclination of the operative line of draft. In a second embodiment, provision is made for selective elevation of the



towing framework relative to the ground with little or no modification of the line of draft for the weeder rod. Where desired, a yieldable connection is described for the rod supports to permit yielding of the subsoil rod when required by obstacles.

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**3,651,871**

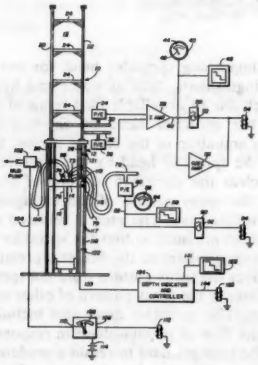
**DRILLING RIG DEPTH CONTROL**

**Palmer G. Greene, Dallas, Tex., assignor to Automatic Drilling Machines, Inc., Dallas, Tex.**

**Filed Apr. 17, 1970, Ser. No. 29,469**

**Int. Cl. E21b *47/04***

**U.S. Cl. 173—21** **6 Claims**



A system which monitors the depth at which a drilling rig is operating and indicates when a predetermined depth is reached by recording the length traveled by the drill pipe supporting member in a predetermined direction within the mast of the drilling rig, comparing the length traveled with a predetermined length, distance or measurement and producing a signal when the two are equal. This may be a prealarm signal or a final alarm signal. Preferably the signal sounds an alarm and automatically interrupts power to the drill pipe supporting member.

**3,651,872**

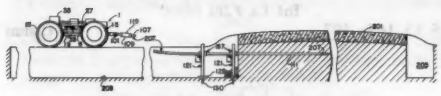
**METHOD OF AND APPARATUS FOR BORING HOLES UNDER STREETS, HIGHWAYS OR THE LIKE**

**Joseph E. Smith, Jr., Sullivan, and A. D. Koen, Esther, both of Mo., assignors to said Smith, by said Koen**

**Filed July 13, 1970, Ser. No. 54,436**

**Int. Cl. E21c *11/02, 19/00***

**U.S. Cl. 173—24** **8 Claims**



Apparatus for boring a hole generally horizontally through the ground underneath an existing structure such as a highway, street, railroad line, building, etc., operating from above ground level at one side of the structure, involving a vehicle having an engine for its propulsion and for rotating a string of boring rod.

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**3,651,873**

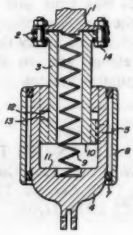
**IMPACTING APPARATUS FOR DRIVING CONVERTIBLE TO PULLING**

**Philipp Uebel; Helmut Heckner, both of Munich, and Gotthilf Schulin, Fellbach, all of Germany, assignors to Wacker-Werke KG, Munich, Germany**

**Filed Jan. 26, 1970, Ser. No. 5,673**

**Int. Cl. E02d *7/06***

**U.S. Cl. 173—29** **32 Claims**



An apparatus for driving and pulling objects such as poles, planks, boardings, and pipes, in which hammer means reciprocated by actuating means are slidably arranged in a holding body, said holding body being provided with a bottom surface and an axially spaced higher shoulder means while said hammer means has a head portion reciprocable between said bottom surface and said shoulder means, spring means selectively being insertable between said actuating means and said bottom surface for selectively converting the apparatus from a driving device to a pulling device.

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**3,651,874**

**PNEUMATICALLY OPERATED IMPACT-ACTION SELF-PROPELLED REVERSIBLE MECHANISM**

**Boris Vasilievich Sudnishnikov, Kransy prospekt, 54, kv. 59; Alexandr Dmitrievich Kostylev, ulitsa Derzhavina, 19, kv. 44; Konstantin Stepanovich Gurkov, ulitsa Derzhavina, 19, kv. 68; Konstantin Konstantinovich Typitsin, ulitsa Krylova, 3, kv. 37; Vladimir Vasilievich Klimashko, ulitsa Navogodnyaya, 44, kv. 23, and Vladimir Dmitrievich Plavskikh, ulitsa Kamenskaya, 83 "v," kv. 33, all of Novosibirsk, U.S.S.R.**

**Filed July 8, 1970, Ser. No. 53,216**

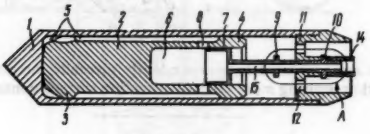
**Claims priority, application U.S.S.R., Feb. 19, 1970, 1399051**

**Int. Cl. E21b *1/00***

**U.S. Cl. 173—91** **3 Claims**

There is disclosed a pneumatically operated impact-action self-propelled reversible mechanism for driving holes in the

earth by compacting the soil around the hole being made, comprising a housing having a pointed end and receiving thereinside an impact member delivering successive impacts upon the housing, as this impact member is reciprocated interiorly of this housing in operation of the mechanism under the action of compressed air, the mechanism further including a compressed air supply sleeve connected with an air conduit member and threadedly secured in a nut for axial displacement relative to this nut, when the air conduit member is rotated. According to the invention, the nut, associated with the compressed air supply sleeve, has a plurality of longitudinal oblique slits made therein, these slits defining therebetween a pair of resiliently deformable cantilever members projecting axially beyond the adjacent face end of the nut, the longitudinal axial lines of these cantilever members extending in opposition to the direction of the displacement of the compressed air supply sleeve, when the latter is screwed into the nut, these cantilever members being adapted to engage an abutment of the compressed air supply sleeve, as the latter is screwed into the nut.



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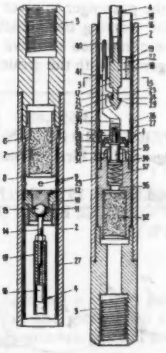
**3,651,875**

**ORIENTATION DEVICE**

**Edwin McInerney, Kalgoorlie, Australia, assignor to Western Mining Corporation Limited, Melbourne, Victoria, Australia**

**Filed Mar. 25, 1970, Ser. No. 22,603**
**Claims priority, application Australia, Mar. 28, 1969, 52697/69**
**Int. Cl. E21b *47/02***
**U.S. Cl. 175—45** **5 Claims**



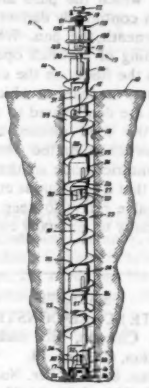
An orientation device to be fitted has part of the lower end of a drill train having a flow passage and a valve movable between two positions, one permitting an open passage and the other closing it. A direction sensitive member is pivotally mounted having an upwardly directed annular shoulder and the valve member has an upwardly directed arm with an extension which engages the valve annular shoulder to hold the valve from its seat.

**3,651,876**

**QUICK ACTING DRIVE CAP ASSEMBLY**

**William P. Henson, Indianapolis, Ind., assignor to Mobile Drilling Company, Inc., Indianapolis, Ind.**

**Filed June 19, 1970, Ser. No. 47,736**
**Int. Cl. F21b *17/00***
**U.S. Cl. 175—323** **12 Claims**



A drive cap assembly for quick attachment and detachment from the top end of an earth boring hollow auger. The assembly has an outer casing with a hexagonally shaped rod mounted to one end for receiving the auger driver. The opposite casing end slips over the top end of the auger. A latch key is mountable to the hexagonal rod with a plug attached to one end for passing through a casing opening and into a slot on the outside surface of the auger thereby securing the drive cap assembly and auger together. A lock ring fits over the casing and latch key. A center rod driver fits within and is rotated by the casing and is threaded on one end to a shaft passing through the hollow auger.

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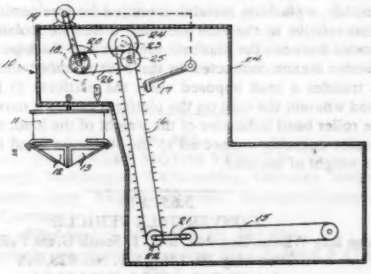
**3,651,877**

**VOLUMETRIC FEEDER BLENDING LINE**

**Dan S. Wise, and James L. Sosebee, both of Gastonia, N.C., assignors to Fiber Controls Corporation, Gastonia, N.C.**

**Continuation-in-part of application Ser. No. 61,780, Aug. 6, 1970, now abandoned. This application Aug. 27, 1970, Ser. No. 71,633**
**Int. Cl. G01g *13/24***
**U.S. Cl. 177—114** **9 Claims**



A feeder for a blending line of the type having a weigh pan, an inclined spiked apron conveyor for delivering fiber material to a location above the pan so that the material falls by gravity into the pan, a doffer and Sargent comb for opening the fibers as they move on the apron conveyor and fall off the conveyor respectively and a single electric motor for

operating the doffer, comb and apron conveyor and control circuitry for operating a plurality of such feeders in a blending line. To minimize wear on the motor, the control circuitry operates a clutch mechanism for clutching the apron conveyor on and off, while the motor and the doffer and comb operated by it run continuously. The control circuitry is capable of being operated in a weigh mode and in a second volumetric mode in which the pans are kept continuously open and the feeders continually deliver fibers to a blending conveyor moving beneath the pan. When the conveyor is stopped by the opening of a switch operated by the equipment which receives the fibers on the conveyor beneath the weigh pans, the clutch mechanism which clutch on and off the apron conveyors are deactivated so that no further fibers are delivered but the feed motors continue to run. A manually operated switch is shifted when the circuitry is to operate in the volumetric mode so that the conveyor runs continuously and so that a continuous current path is created through the dump valve relays to keep the pans open, thus eliminating the necessity to manually cut off air to the dump valves.

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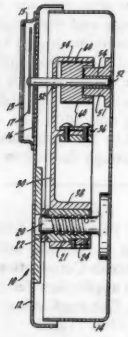
**3,651,878**

**ROLAMITE SCALE CONSTRUCTION**

**Gordon A. Cooley, Chicago, Ill., assignor to The Borg-Erickson Corporation, Chicago, Ill.**

**Filed Jan. 8, 1970, Ser. No. 1,414**
**Int. Cl. G01g** *3/08, 21/02, 23/26*
**U.S. Cl. 177—230** **20 Claims**



There is disclosed a bathroom scale comprising a base member, a platform member mounted for free vertical movement relative to the base member, a flexible Rolamite band located between the platform member and the base member, transfer means connected to the base member and adapted to transfer a load imposed upon the platform to the roller band wherein the load on the platform causes a movement of the roller band indicative of the weight of the load, and an indicator operably connected to the Rolamite band indicating the weight of the load.

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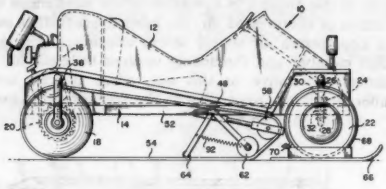
**3,651,879**

**CONVERTIBLE VEHICLE**

**Leon Ray Wilson, Box 943, R.R. 1, South Great Falls, Mont.**

**Filed May 29, 1969, Ser. No. 828,948**
**Int. Cl. B62m** *27/02;* **B62d** *55/04*
**U.S. Cl. 180—5 R** **13 Claims**

A motor vehicle designed for use in deep sand as a "dune buggy" but easily adaptable for use in snow by the application of traction belts to the driven rear wheels and skis to the front wheels. Tension wheels and pressure rollers insuring maximum traction surface contact with the snow are mounted on the frame of the vehicle by a single mounting rod or pin such that the entire tension wheel and pressure roller assembly can be removed in one step. The pressure rollers are journaled to independently pivotally mounted rods further insuring more complete traction surface contact.



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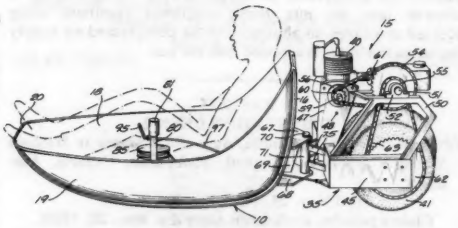
**3,651,880**

**MOTOR DRIVEN PASSENGER VEHICLE**

**Edwin B. Hatch, Grafton, and Steven Schwengel, Milwaukee, both of Wis., assignors to Brookfield Industries, Inc., Brookfield, Wis.**

**Filed Nov. 24, 1969, Ser. No. 879,164**
**Int. Cl. B62m** *27/02*
**U.S. Cl. 180—6 R** **5 Claims**



A passenger carrying vehicle having a passenger carrier that is propelled by a rear power unit. The passenger carrier is pivotally connected to a power unit which is behind the carrier to push it along the desired path of travel. A control linkage enables the passenger to pivot the power unit relative to the carrier for steering the vehicle. The power unit includes an engine connected to drive a single driving wheel which is in engagement with the ground.

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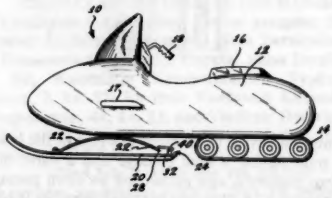
**3,651,881**

**BUMPER GUARD FOR SNOWMOBILES**

**Leonard S. Dodgson, 220 First Avenue North, Jamestown, N. Dak.**

**Filed May 8, 1970, Ser. No. 35,791**
**Int. Cl. B62m** *27/02*
**U.S. Cl. 180—5 R** **3 Claims**



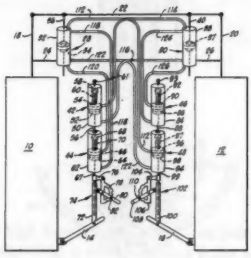
A protective bumper mounted over the rearward end of the skis of a snowmobile to prevent the trailing end of the skis from hitting the bottom of the snowmobile body.

3,651,882

## SYSTEM FOR MAINTAINING LATERALLY SPACED VEHICLES LONGITUDINALLY ABREAST

Raymond W. Loesch, 1601 East Oklahoma Street, Enid, Okla.

Filed May 7, 1970, Ser. No. 35,338
Int. Cl. B60d 7/00
U.S. Cl. 180—14 R 16 Claims



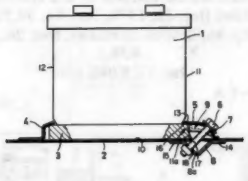
A system for simultaneously operating a plurality of vehicles from one of the vehicles to automatically maintain them in horizontal alignment abreast of each other, which system includes a linkage interconnecting the steering mechanisms of the vehicles to produce identical turning movement in the vehicles, and a closed hydraulic-mechanical system which is connected to speed contro! devices on the several vehicles so that any vehicle which advances beyond other vehicles in the array will actuate a hydraulic signal which is used to change the relative speeds of the vehicles to restore horizontal alignment of the several vehicles.

3,651,883

## HOLDING CLAMP FOR BATTERY HOUSINGS

Walter Aldag, Wolfsburg, Germany, assignor to Volkswagenwérk Aktiengesellschaft, Wolfsburg, Germany

Filed Sept. 26, 1969, Ser. No. 861,411
Claims priority, application Germany, Sept. 27, 1968, P 17 80 551.5
Int. Cl. B60r 18/02
U.S. Cl. 180—68.5 6 Claims



A device for clamping down a battery housing on a base plate having stop bracket and a clamp so that a screw bolt passing through the plate and bracket will secure the housing down on the base plate.

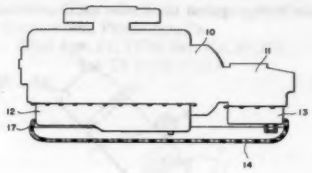
3,651,884

## OIL DRIP GUARD

Carl W. Dorries, 1308 Springlake Drive, Dallas, Tex.

Filed Sept. 24, 1969, Ser. No. 860,608
Int. Cl. B62d 25/20
U.S. Cl. 180—69.1 5 Claims

Disclosed is a pan for collecting oil drippage from motor vehicle engines and for protecting the underside of such engines from flying debris such as rocks and the like. The pan is



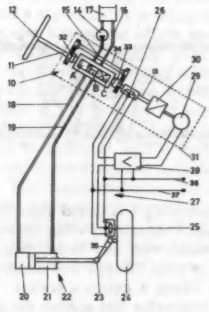
adapted to be mounted under lateral stress and maintained in a state of compressional stress to prevent resonant vibrations.

3,651,885

## HYDROSTATIC STEERING SYSTEM FOR VEHICLES

Armin Lang, Friedrichshafen, Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Sept. 15, 1970, Ser. No. 72,321
Claims priority, application Germany, Sept. 18, 1969, P 19 47 205.0
Int. Cl. B62d 5/06
U.S. Cl. 180—79.2 R 7 Claims



The wheels of a vehicle are turned by fluid power operating devices when pressurized in response to directionally controlled shift of a control valve from a neutral position. The valve is shifted in opposite directions by manual rotation of a hand wheel and in a followup direction by a reversible motor through a self-locking reduction gear drive. Position sensing devices monitor followup movement of the motor and turning movement of the vehicle wheels to control energization of the motor in response to unbalance of a bridge circuit.

3,651,886

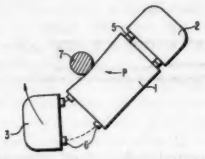
## PASSENGER MOTOR VEHICLE

Bela Barenyi, Maichingen, Wurttemberg, Germany, assignor to Daimler-Berg Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Sept. 5, 1969, Ser. No. 855,508
Claims priority, application Germany, Sept. 7, 1968, P 17 80 375.7
Int. Cl. B60r 19/00
U.S. Cl. 180—91 7 Claims

A passenger motor vehicle, in particular of cellular-type construction, in which the junction or connecting places between the center section, itself constructed as rigid as possible, and its end section are so constructed and arranged that intentional, predetermined rupture lines or areas are

formed thereby; connecting elements with intentional rupture places may be used for that purpose which become disengaged or disconnected in case of forces of predetermined magnitude acting against the center section of the vehicle in



the vehicle transverse direction. The intentional disconnection may be aided or brought about by suitably placed explosive charges, detonated only by transversely directed forces of predetermined magnitude.

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**3,651,887**

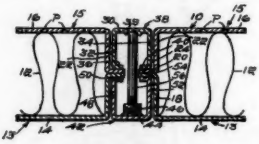
**ACOUSTICAL ASSEMBLY WITH CONNECTORS HAVING LIPS**

**Oliver C. Eckel, P.O. Box 226, Weston, Mass.**

**Filed Oct. 19, 1970, Ser. No. 81,765**

**Int. Cl. E04b *1/84***

**U.S. Cl. 181—33 G** **8 Claims**



An acoustic assembly has sound absorbing panels held in place by U-shaped connectors having oppositely disposed lips that extend parallel with and bear against flanges on the panels. A bolt extends through one connector and into the next connector where it enters a socket. Tightening of the bolt draws the connector lips against the panel flanges thus tightening the assembly.

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**3,651,888**

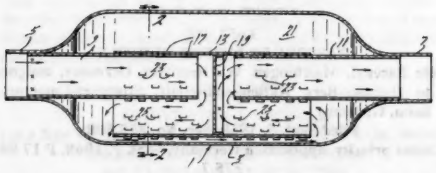
**MULTI-PASS MUFFLER**

**John P. Andres, Jackson, Mich., assignor to Tenneco Inc., Racine, Wis.**

**Filed July 24, 1970, Ser. No. 58,124**

**Int. Cl. F01n *1/08, 7/18***

**U.S. Cl. 181—53** **5 Claims**



A muffler construction provides a flow path through a tubular shell which has four reversals in direction by means of a novel arrangement of tubular elements and only a single partition.

**3,651,889**

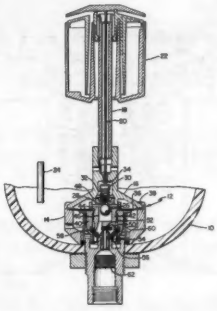
**LIQUID SUPPLY APPARATUS FOR AIR LINES**

**John J. Humphrey, Denver, Colo., assignor to C. A. Norgren Co., Littleton, Colo.**

**Filed Feb. 16, 1970, Ser. No. 11,534**

**Int. Cl. F16n *29/02***

**U.S. Cl. 184—55 A** **10 Claims**



Liquid supply apparatus for air lines and the like, of the type employing float controlled reservoirs, each of which is maintained at a substantially constant level, and supplied from a central source, such as oil under pressure, characterized by a pair of bowl filling valves which operate in backup relationship such that a first valve normally closes flow to the bowl, while a second downstream valve remains open, but in the event the first valve fails to close as normally intended, the second valve becomes operative and closes, thereby preventing overfilling the bowl.

It has particular utility with a throwaway or non-repairable unit which may be economically manufactured and which is also tamper-proof. These features involve a construction in which certain parts are secured together by non-removable interference fits, in lieu of removable threaded fastenings and the like formerly employed. In lieu of a dynamic seal subject to wear, such as an O-ring, a static seal is provided having portions which are flexibly distortable.

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**3,651,890**

**DEVICE FOR SELF-SERVICE STORES**

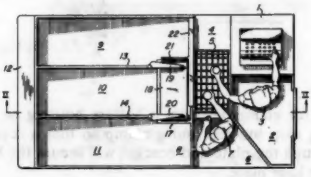
**Werner Potrafke, Hufeisenstrasse 6, 432 Hattingen, Germany**

**Filed Dec. 21, 1970, Ser. No. 99,778**

**Claims priority, application Germany, Dec. 20, 1969, P 19 64 038.1**

**Int. Cl. E04h *3/04***

**U.S. Cl. 186—1 A** **21 Claims**



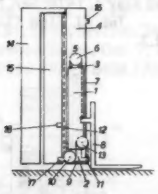
A device for self-service stores, in which in front of the withdrawal compartments from which the customer withdraws his purchased checked-out goods there is provided a conveyor belt while between the latter and said withdrawal compartments there are provided two pivotal confining plates movable selectively into an open or closed position depending on the respective withdrawal compartment to be charged.

3,651,891

## HOIST FOR LIFT TRUCKS

Gennaro Pittaluga, Milan, Italy, assignor to Fiat Soc. per Azioni Azienda OM Stabilimento di Milano, Milan, Italy

Filed Oct. 17, 1969, Ser. No. 867,332
Claims priority, application Italy, Aug. 8, 1969, 20724 A/69
Int. Cl. B66b *9/20*
U.S. Cl. 187—9 1 Claim



Hoist of the high free-lift type with three pairs of masts, for lift trucks, comprising a plate carrying forks slidable in the guides of the innermost pair of masts, the latter being slidable in the guides of the pair of movable intermediate masts sliding in turn in the grooves of the pair of fixed masts, a telescopic cylinder with two pistons, namely a smaller and a larger piston, mechanical transmission means adapted to transmit the movements from the cylinder to the plate and thereafter to the movable masts, and abutment means for carrying the pair of intermediate masts along, in which the smaller piston is connected to the plate to obtain, with respect to the cylinder, movements of the plate twice those of said smaller piston, and the larger piston is connected to the pair of fixed masts to obtain movements of the cylinder with respect to the fixed masts three times those of the larger piston with respect to the cylinder itself, the thrust area of the larger piston being practically one and a half times the thrust area of the smaller piston.

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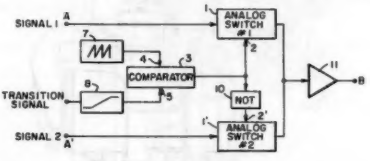
3,651,892

## SWITCHING TECHNIQUES AND DEVICES

Andras I. Szabo, Export, and Charles L. Winkler, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 24, 1970, Ser. No. 13,660
Int. Cl. H03k *17/26*
U.S. Cl. 187—29 R 15 Claims



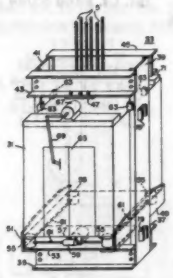

A method and a device for introducing or removing an electrical signal through rapid switching of an analog switch between the on and off conditions with the switch remaining in one condition longer initially, and then progressively less in the one condition and longer in the other until the transfer has been completed. The magnitude of a repetitive waveform is compared with the magnitude of a ramp waveform to generate the control signal which determines the interval that the switch remains in a given condition. By controlling the on and off condition of a second switch in opposition to the first switch and by combining the outputs of the switches, a smooth transition between two control signals is achieved. The method and the device are applied to an elevator speed control system wherein transition is provided between several signal sources.

3,651,893

## DUPLEX COUNTERWEIGHTLESS SHUTTLE ELEVATOR SYSTEM

Harry Berkovitz, Glenrock, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 21, 1970, Ser. No. 30,375
Int. Cl. B66b *17/12*
U.S. Cl. 187—94 7 Claims



Elevator cars suspended from opposite ends of a traction driven hoist cable counterbalance each other and provide ideal spacing between cars serving two terminal floors such as a main floor and a sky lobby. A leveling device on one or both cars provides for adjustment of the position of the associated car relative to the hoist cable to accommodate for cable stretch and settling of the building so that each car can be brought into exact registry with the adjacent landing. The cars can be arranged to stop at pairs of intermediate floors located equal distances from the two terminal floors and can be further arranged to distribute load in opposite directions from a third terminal located halfway between the first and second terminals. The counterbalanced cars can be combined with a second elevator system, either a conventional system or a counterbalanced system, for sky lobby operation with the counterbalanced car system providing either the shuttle service, the local service or both.

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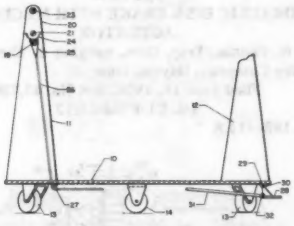
3,651,894

## SERVING CART

Nicholas Alfred Auriemma, Miami, Fla., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed June 4, 1970, Ser. No. 43,333
Int. Cl. B62b *5/04*
U.S. Cl. 188—19 4 Claims



An improved serving cart having a braking means which is biased to be in a braking position. The brake shoe is maintained in pressure contact with an adjacent wheel via a spring means. It is deactivated when the operator pushes or pulls the cart with one of the two handles provided on an upper portion of the cart. In an alternative arrangement, pedals are

provided on a lower portion of the cart which provide a means by which the braking means is activated or deactivated.

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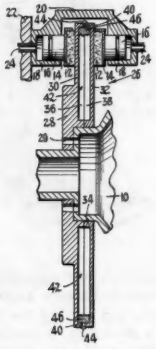
**3,651,895**
**SUPER-COOLED DISK BRAKE**
**Marshall G. Whitfield, High Ridge Road, Brookfield Center, Conn.**
**Filed Jan. 5, 1970, Ser. No. 770**
**Int. Cl. F16d** *65/84*
**U.S. Cl. 188—71.6** **9 Claims**



A rotary brake comprising a disk adapted to have its opposite sides engaged by brake shoes which are in the form of pads arranged to grip the disk between them in the manner of a caliper. The brake disk has a plurality of closed, radially extending passages in which there are slugs of sodium or a similar metal which has a low melting and vaporization point. When the brake disk becomes heated due to the friction of the braking action, the sodium metal melts and vaporizes, thereby absorbing a great deal of heat. The vaporized metal condenses near or at the central portions of the disk, taking the form of small globules which are then thrown outward by centrifugal force toward the large-diameter peripheral portions so as to be ready again for subsequent vaporization. The vaporizing and condensing action of the sodium removes heat from the larger-diameter peripheral portions of the disk, transferring such heat to the inwardly disposed or small-diameter disk portions, thereby effecting a super cooling of the disk at the areas which are being contacted by the brake shoes.

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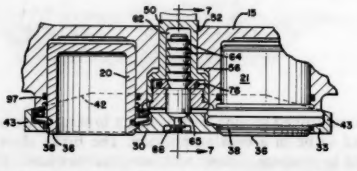
**3,651,896**
**HYDRAULIC DISK BRAKE WITH MECHANICAL ACTUATOR**
**Chester N. Fannin, Troy, Ohio, assignor to The Dayton Steel Foundry Company, Dayton, Ohio**
**Filed June 19, 1970, Ser. No. 47,780**
**Int. Cl. F16d** *65/52*
**U.S. Cl. 188—71.8** **6 Claims**



A caliper type disk brake includes a mechanical actuator which operates independently of the hydraulic pistons and incorporates a pressure plate which is supported on the pistons and a centrally disposed actuator plunger. The actuator plunger incorporates a mechanical adjuster for taking up slack in the actuator.

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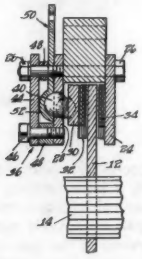
**3,651,897**
**CALIPER TYPE BRAKE STRUCTURE**
**Emil H. Hahn, St. Joseph, Mich., assignor to Lambert Brake Corporation, St. Joseph, Mich.**
**Filed May 4, 1970, Ser. No. 34,393**
**Int. Cl. F16d** *55/46*
**U.S. Cl. 188—72.2** **7 Claims**



The brake unit as described herein is a caliper disc brake to be mounted in relationship to a driving disc which may be fixed or slideably mounted to a shaft or other driving means, which driving means is capable of imparting rotation to the disc. The caliper disc brake assembly is provided for stopping the rotation of the driving disc by utilizing externally applied actuating or energizing force and automatically applied internal actuating or energizing force.

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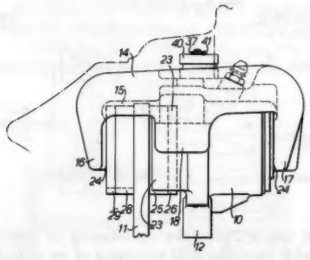
**3,651,898**
**DISC BRAKE CALIPER STRUCTURE**
**Gordon A. Habgood, Shipston-on-Stour, England, assignor to Girling Limited, Tyseley, Birmingham, England**
**Filed Oct. 24, 1969, Ser. No. 868,991**
**Int. Cl. F16d** *55/228*
**U.S. Cl. 188—72.5** **22 Claims**



In a disc brake of the kind in which friction pad assemblies are urged into engagement with opposite faces of a rotatable disc by operation of an hydraulic actuator which applies one friction pad assembly directly to one face of the disc and other friction pad assembly to the opposite face of the disc through a yoke guided to slide relative to a stationary member mounted adjacent to the disc, the yoke comprises a one piece assembly adapted to fit over the stationary member and a portion of the periphery of the disc. The yoke is provided with a pair of spaced flat parallel guiding surfaces of substantial radial depth for direct operative engagement with

complementary flat guiding surfaces on opposite sides of the stationary member, and the guiding surfaces on the yoke, at least at one pair of corresponding ends, lead into opposed bearing surfaces for engagement with complementary shoulders on the stationary member.

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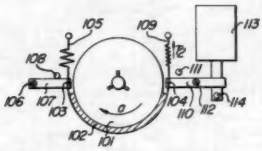
**3,651,899**
**BRAKE DEVICE IN TAPE RECORDER**
**Tetsuji Yoshii, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**
**Filed Mar. 31, 1970, Ser. No. 24,219**
**Claims priority, application Japan, Oct. 7, 1969, 44/80056**
**Int. Cl. F16d *49/00*; B60t *13/04***
**U.S. Cl. 188—77 R** **2 Claims**




A brake device in a tape recorder which includes a brake band entrained on a braked drum for movement in the direction of the braked drum, whereby one end portion of the brake band engages stop means in accordance with the direction of rotation of the braked drum to thereby provide a slack end portion of the brake band, while the other end portion of the brake band provides a tight portion to which is imparted a spring force having a predetermined characteristic.

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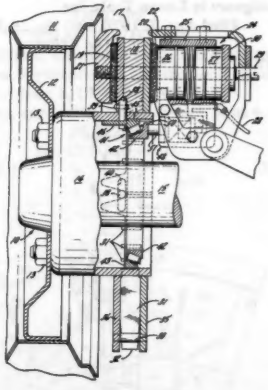
**3,651,900**
**ANTI-SKID BRAKE**
**Orville A. Feikema, 18844 Wildwood Avenue, Lansing, Ill.**
**Filed Mar. 16, 1970, Ser. No. 19,770**
**Int. Cl. B60t *8/16***
**U.S. Cl. 188—181 T** **6 Claims**



An antiskid brake in which a brake disc is resiliently attached to a vehicle wheel. hen braking torque forces are applied to the disc brake, a deformation in the resilient member and consequent movement of associated parts occurs. This movement controls the amount of frictional braking torque force exerted upon the brake disc in a manner such that the frictional braking torque does not exceed that which may be transmitted by the vehicle wheel to the road surface without excessive wheel slip and the consequent lockup and skid.

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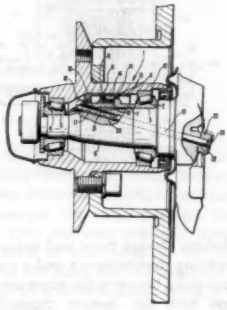
**3,651,901**
**INSTALLATION FOR THE BRAKE LOCKING PREVENTION**
**Manfred H. Burckhardt, Alte Winnender Steige, and Paul Schwerdt, Esslingen-Hebensberg, both of Germany, assignors to Daimler-Benz Aktiengesellschaft**
**Filed Mar. 13, 1970, Ser. No. 19,285**
**Claims priority, application Germany, Mar. 19, 1969, P 19 13 813.7**
**Int. Cl. B60t *8/08***
**U.S. Cl. 188—181 A** **42 Claims**



An installation for preventing the locking of brakes in vehicles, preferably in motor vehicles in which sensing members are provided at the wheels that supply to a common comparator an output signal corresponding to the wheel rotational speed; each sensing member is thereby arranged on the inside of the corresponding wheel mounting, preferably between the inner wheel bearing and outer wheel bearing.

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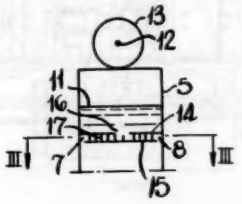
**3,651,902**
**HYDROPNEUMATIC SHOCK ABSORBER**
**Carl Ullrich Peddinghaus, Obere Lichtenplatzer Str. 276, 56 Wuppertal-Barmen, Germany**
**Filed Dec. 15, 1969, Ser. No. 885,381**
**Int. Cl. F16f *9/40***
**U.S. Cl. 188—269** **1 Claim**




A hydropneumatic shock absorber having a working cylinder, a piston and a compensating chamber at one end of the working cylinder. The working cylinder and the compensating chamber are interconnected by a pair of pipes arranged so that the two pipe ends forming one pair of pipe ends are disposed at diametrically opposite positions. The diametrically opposite pipe ends communicate with the working cylinder and there is also provided an attachment member for use in mounting the shock absorber in its opera-

tive position in such a way that when the shock absorber is installed in a non-vertical orientation the diametrically opposite pipe ends can be arranged so that one of them is at the highest part of the working cylinder.

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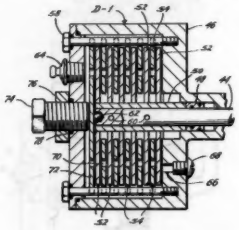
**3,651,903**

## ADJUSTABLE ROTARY DAMPER

**Henry G. Butler, Houston, and Irvin B. Weise, Bellaire, both of Tex., assignors to Anderson, Greenwood & Co., Houston, Tex.**

**Filed Aug. 21, 1969, Ser. No. 852,022**
**Int. Cl. F16d** *57/02*
**U.S. Cl. 188—290** **6 Claims**



A rotary damper having rotor and spacer plates with relatively close spacing therebetween and a viscous fluid to provide a fluid coupling between the rotor and stator plates and a combination with the damper connected to damp the movement of the valve member of a swing check valve.

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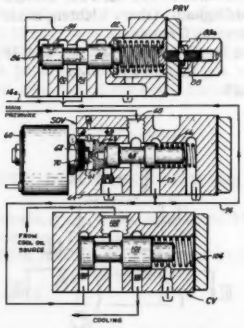
**3,651,904**

## TRANSMISSION WITH SIMULTANEOUSLY ENGAGED CLUTCHES FOR BRAKING

**Joseph B. Snoy, and Bradford K. Shull, both of Rockford, Ill., assignors to Twin Disc, Incorporated, Racine, Wis.**

**Filed June 16, 1970, Ser. No. 46,767**
**Int. Cl. B60k** *29/02*
**U.S. Cl. 192—4 A** **1 Claim**



A power transmission of the type having interchangeable gear sets connected to hydraulically actuated friction clutches. The clutches are selectively engageable to establish various gear ratios for changing the speed and direction of the vehicle. A brake is provided for the transmission by engaging a pair of these hydraulically actuated clutches at the same time, the two clutches being connected to a common jack shaft through gears of different ratios. The jack shaft is geared directly to the wheels of the vehicle and by engaging both clutches at the same time, the gears have no synchronous ratio except zero r.p.m. Thus, one of the clutches has been engaged and the second clutch is then engaged to cause the braking action, the second clutch slipping until the vehicle stops.

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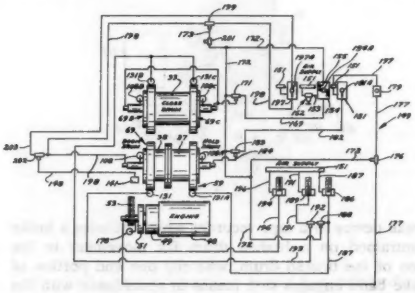
**3,651,905**

## CLUTCH AND BRAKE CONTROLS FOR CLAMSHELL HOIST

**Archer W. Brown, St. Paul, Minn., assignor to American Hoist & Derrick Company, St. Paul, Minn.**

**Filed Jan. 13, 1970, Ser. No. 2,567**
**Int. Cl. F16d** *67/04*
**U.S. Cl. 192—17 A** **18 Claims**



A material handling machine having a clamshell bucket and a hoist assembly having a closing drum, a holding drum, and a boom drum all connected through a gear train to a power source. The holding drum and boom drum are rotatably mounted on a common shaft. Separate clutch and brake units associated with each of the drums have coordinated controls so that the holding line and closing line have substantially the same amount of movement during the lowering and the raising of the bucket.

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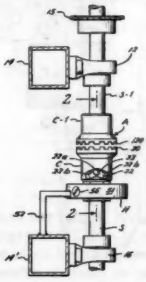
**3,651,906**

## AUTOMATIC MECHANICAL CLUTCH

**Damon T. Slator, and Archie R. Wilson, both of Houston, Tex., assignors to Bowen Tools, Inc.**

**Filed Apr. 2, 1970, Ser. No. 25,216**
**Int. Cl. F16d** *43/00*
**U.S. Cl. 192—35** **7 Claims**

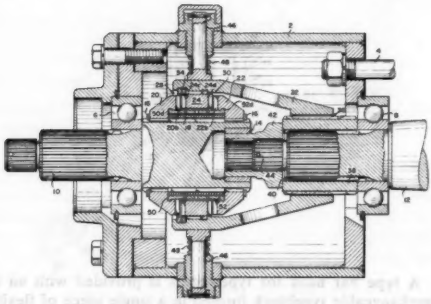


A new and improved automatic mechanical clutch adapted to releasably interconnect two shafts upon a rotation of one of the shafts, and to disconnect such shafts when the rotation of such shaft is discontinued.

## 3,651,907
## OVERRUNNING CLUTCH FOR TRANSFER CASE TRANSMISSION

Albert F. Myers, Sr., Warren, Mich., assignor to Boise Cascade Corporation, Boise, Idaho

Filed Aug. 3, 1970, Ser. No. 60,386
Int. Cl. F16d *41/00, 11/04, 23/08*
U.S. Cl. 192—43 12 Claims

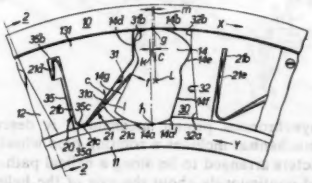


A reversible overrunning clutch adapted for use in a transfer case transmission, characterized by the provision of holdout ring means for maintaining the clutch in a disengaged condition as long as a driven shaft has a speed of rotation greater than that of a driving shaft. A central drive member is axially shiftable between two alternate clutch-engaged positions as a function of the direction of rotation of the driving shaft. The holdout ring means include a pair of colinearly arranged rings rotatably mounted on opposite sides of the central drive member, respectively, said rings having lug portions that extend axially between radial projections on the inner periphery of the central drive member. Stepped portions on the lugs define lands that are adapted to engage the radial projections to retain the drive member in the disengaged condition.

## 3,651,908
## SPRAG CLUTCHES

Benjamin D. Oldfield, Cheadle Hulme, England, assignor to Renold Limited, Wythenshawe, Manchester, England

Filed June 1, 1970, Ser. No. 42,433
Claims priority, application Great Britain, June 6, 1969, 28,832/69
Int. Cl. F16d *41/07*
U.S. Cl. 192—45.1 27 Claims

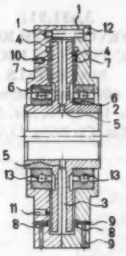


A sprag clutch in which the forces on the sprags during outer race over running give rise to only a small but positive rubbing load between the sprags and the inner race at all outer race over running speeds within a designed limit.

## 3,651,909
## FRICTION DISC CLUTCH OR BRAKE

Irakli Zautaszwili, Poznan, Poland, assignor to Zaklady Przemyslu Metalowego H. Cegielski, Posnan, Poland

Filed Oct. 16, 1969, Ser. No. 867,039
Claims priority, application Poland, Oct. 19, 1968, P.129633
Int. Cl. F16d *25/04*
U.S. Cl. 192—88 A 2 Claims

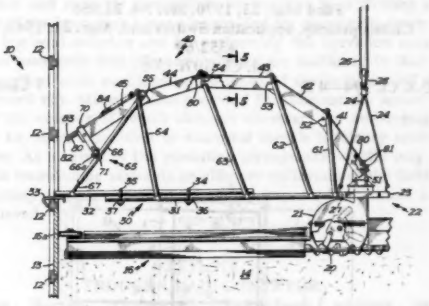


A friction disc clutch or brake has axially spaced friction discs within a hollow body, the space between the discs providing a pressure chamber to which are connected fluid inlet and outlet passages: the outlet passages have a greater resistance to flow than the inlet passages. Specifically, the outlet passage includes an annular space between the outer periphery of each of the discs and the adjacent interior wall of the hollow body. In a modification, there is not outflow, but only an inlet passage.

## 3,651,910
## ADJUSTABLE DISCHARGE MEANS

Floyd E. Buschbom, Long Lake, Minn., assignor to Van Dale Corporation, Long Lake, Minn.

Original application Jan. 28, 1969, Ser. No. 794,607, now Patent No. 3,539,059. Divided and this application Apr. 3, 1970, Ser. No. 25,355
Int. Cl. B65g *11/12, 11/14, 11/16*
U.S. Cl. 193—17 19 Claims



A surface or top silo unloader of the type having a pair of augers for gathering material to the center of the silo and delivering it to an impeller which discharges the material from the silo. The discharge chute is curved in a vertical plane and has one end connected to the impeller for guiding the material discharged thereby and directing it out through an opening in the wall. A unique linkage means automatically adjusts the curvature of the discharge chute to maintain a substantially constant curvature therein as the unloader moves downwardly in the silo a substantial distance to substantially reduce the number of times that it is necessary to

climb the silo and reposition the remote end of the discharge chute. An optional liner for the discharge chute is rigidly attached to the chute at the end adjacent the impeller and is resiliently connected to the chute at the remote end thereof whereby the liner will closely follow the contour of the chute without buckling, as the curvature of the chute is varied to protect the chute from wear and to provide a smooth continuous surface on the interior of the chute.

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**3,651,911**

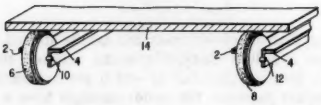
**GRAVITY CONVEYOR WITH ROLLERS HAVING ELASTOMERIC TIRES OF HIGH HYSTERESIS MATERIALS**

**Andrew T. Kornylak, 400 Heaton Street, Hamilton, Ohio**

**Filed Feb. 16, 1970, Ser. No. 11,483**

**Int. Cl. B65g** *13/00*

**U.S. Cl. 193—35** **6 Claims**



A gravity conveyor comprising spaced parallel tracks mounting a series of rollers having tires of elastomeric material. The rollers comprise a rigid hub on which tires of polyurethane are mounted. The cross-sectional shape of the tires have annular zones of increasing area from the periphery toward the base to provide deformation of selected masses of elastomer under variable loaded conditions.

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**3,651,912**

**APPARATUS TO RELEASE GARBAGE-FILLED RECEPTACLES DOWN A SHAFT**

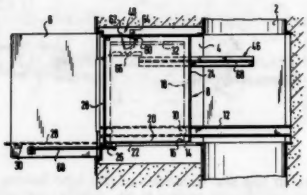
**Otto Rohner, Vaduz, Liechtenstein, assignor to Mideco Mediterranean Industrial Development Establishment, Vaduz, Liechtenstein**

**Filed Mar. 23, 1970, Ser. No. 22,055**

**Claims priority, application Switzerland, Mar. 21, 1969, 4352/69**

**Int. Cl. G07f** *1/06*

**U.S. Cl. 194—4 R** **7 Claims**



An apparatus to release garbage-filled receptacles down a garbage shaft provided with a door which includes an infeed opening within which are positioned screw devices to cooperate with a receptacle when the latter is placed in the opening. When the receptacle is correctly positioned for release down the shaft, the sensor devices are actuated and as a result the releasing procedure is free to occur.

**3,651,913**

**TYPE BAR HEAD FOR TYPEWRITERS HAVING AN INTERCHANGEABLE TYPE BLOCK**

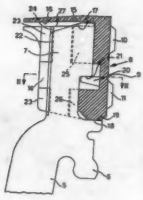
**Walter Albrile, Torino, Italy, assignor to Ingo C. Olivetti & C., S.p.A., Torino, Italy**

**Filed July 22, 1969, Ser. No. 843,571**

**Claims priority, application Italy, July 22, 1968, 52544 A/68**

**Int. Cl. B41j** *1/02*

**U.S. Cl. 197—36** **3 Claims**



A type bar head for typewriters is provided with an interchangeable typeblock formed in a single piece of flexible plastic material covered with a deposit of metal. The type block is provided with a pair of flanges having a pair of wedge shaped projections engaging two chamfered edges of the type bar to block the type block in a direction perpendicular to the printing surface and with a resilient tongue between the flanges to lock the type block in a direction parallel to the printing surface.

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**3,651,914**

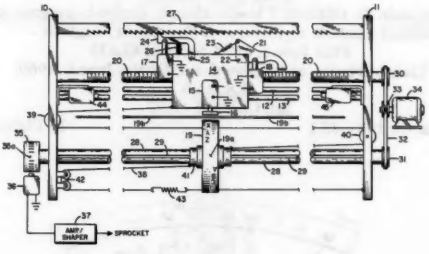
**ASYNCHRONOUS PRINTER**

**Robert A. Locke, Lansdale, Pa., assignor to Sperry Rand Corporation, New York, N.Y.**

**Continuation of application Ser. No. 782,319, Dec. 9, 1968, now abandoned. This application Jan. 22, 1971, Ser. No. 108,951**

**Int. Cl. B41j** *1/22*

**U.S. Cl. 197—49** **3 Claims**

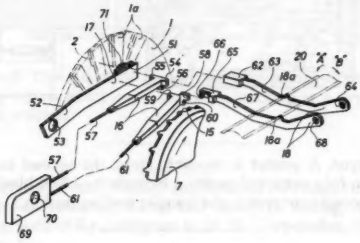



An asynchronous printer mechanism is described. The printer mechanism includes a rotating type wheel which has its characters arranged to lie along a helical path. The wheel is rotated continuously about the axis of the helical path. A drive mechanism which is coupled to the wheel is operable upon receipt of a data character to be printed to step the wheel along a print line one column at a time. A rack and pawl mechanism is added to hold the print wheel at its last columnar printing position until the next character to be printed is received.

## 3,651,915
## PRINTING MECHANISM FOR ELECTRICALLY OPERATED OFFICE MACHINES

Dieter Folkens, Wilhelmshaven, Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany

Filed Nov. 6, 1969, Ser. No. 874,602
Claims priority, application Germany, Nov. 7, 1968, P 18 07 387.5
Int. Cl. B41j *1/32*
U.S. Cl. 197—53 10 Claims

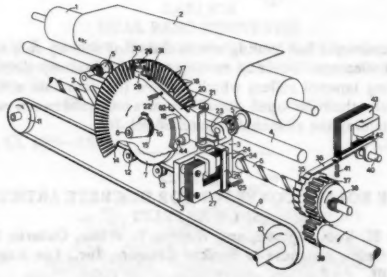


A printing arrangement for use with typewriters in which a continuously rotating type disc carries indicia on spring strip members radially arranged about the type disc. A driving shaft rotates the type disc continuously as well as a cam. Selecting hammers are provided in the proximity of the cam and strike the strip members selectively in accordance with the actuation of levers set into position with solenoids. The printing action takes place on the fly while the type disc is in continuous rotation.

## 3,651,916
## PRINTING DEVICE WITH INTERCHANGEABLE PRINTING MEMBERS

Raffaele Becchi, Ivrea, Italy, assignor to Ing C. Olivetti C & C., S.p.A., Torino, Italy

Filed Jan. 24, 1969, Ser. No. 793,810
Claims priority, application Italy, Feb. 29, 1968, 50314-A/68
Int. Cl. B41j *1/26, 1/34*
U.S. Cl. 197—54 4 Claims

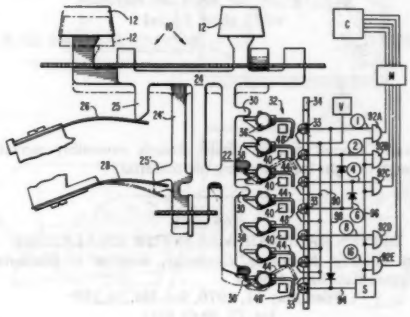


A printing device comprising a continuously rotating disc having a plurality of flexible type carrying segments and a hammer for causing individual segments to move into contact with a paper on a platen. Control means are provided for actuating the hammer at the proper instant relative to the constantly rotating disc so that the preselected character is printed.

## 3,651,917
## KEYBOARD MECHANISM AND ASSOCIATED CODE CONVERTING CIRCUITRY

Nicholas Kondur, Jr., Plymouth Township, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 12, 1969, Ser. No. 823,843
Int. Cl. B41j *5/08*
U.S. Cl. 197—98 14 Claims



This invention relates generally to code conversion and more particularly to the production of electrical signals from a keyboard, the keys of which are operatively connected to one or more individual current control devices, such as reed switches, whose activation to conducting or nonconducting operating conditions is determined by the presence or absence of an influencing magnetic field. The disclosure illustrates a compact assembly of dry reed switches and associated magnets and magnetic shields or shunts, each shunt normally being interposed between its associated magnet and switch and movable to a withdrawn position by activating a key of the keyboard. Means is provided for electrically strobing the reed switches and for performing this operation only after assurance that all reed switches are stabilized in their prescribed code positions as the result of the actuation of a selected key. Means is also provided for substantially lessening the number of switch closures necessary for converting the keyboard operation to electrical signals in binary code form. As a result of the mounting arrangement of the magnetic transducing elements an efficient utilization of the field shunting operation is obtained and an improved key touch is achieved.

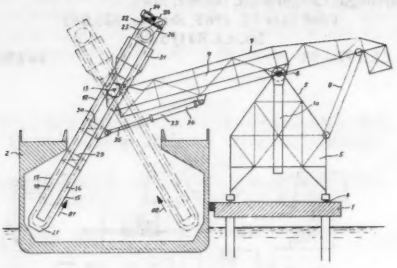
## 3,651,918
## TROUGH CHAIN CONVEYOR

Rene Herzog, Niederuzwil, Switzerland, assignor to Gebrueder Buehler AG, Uzwil, Switzerland

Filed Apr. 14, 1970, Ser. No. 28,480
Claims priority, application Switzerland, Apr. 15, 1969, 5654/69
Int. Cl. B65g *21/12, 65/06*
U.S. Cl. 198—11 6 Claims

A trough chain conveyor for unloading, from the top, vessels such as ships, barges and the like is pivotally supported on a crane with means for arranging the conveyor at a plurality of angles to the vertical. The material is conveyed upwardly through troughs to the upper end of the conveyor and then is unloaded into a discharge container supported on the conveyor. Another conveyor is located on the crane for

receiving the unloaded material and completing the unloading operation. The trough chain conveyor contains a pair of laterally spaced endless chain strands reversibly movable through troughs for unloading the material.



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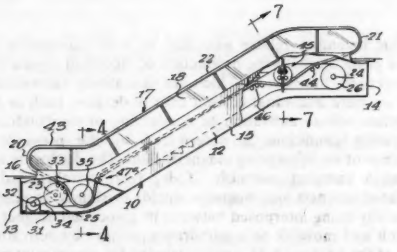
**3,651,919**

**DRIVEN HANDRAIL MEANS FOR ESCALATORS**

**Kurt Vollmer, Hamburg, Germany, assignor to Rheinstahl Eggers-Kehrhahn GmbH**

**Filed May 11, 1970, Ser. No. 36,230**
**Int. Cl. B66b** *9/12*
**U.S. Cl. 198—16 R** **9 Claims**



An escalator having transparent balustrades and driven handrail means in which a handrail shaft is immediately adjacent the shaft which carries the driven sprockets for the step chains and is provided with drive sprockets that are directly engaged by the step chains so as to be driven by the latter. Handrails are guided beneath sheaves that are fixedly mounted on the drive sprockets, and guide roller sets support the handrails and maintain them in driving engagement with the bottoms of the sheaves. In an area remote from the handrail shaft are handrail tensioning means including a self-adjusting tensioning sheave mounting.

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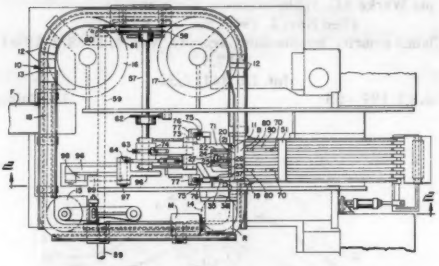
**3,651,920**

**PRESS FEED**

**Walter J. Grombka, and Lloyd B. Lyon, both of Tiffin, Ohio, assignors to The National Machinery Company, Tiffin, Ohio**

**Filed Oct. 20, 1969, Ser. No. 867,736**
**Int. Cl. B65g** *47/00, 47/42*
**U.S. Cl. 198—21** **9 Claims**

A feeder for delivering blanks from a heating station to a loading station of a transfer for a forging machine at a rate which corresponds to a desired feed rate for the machine. The feeder includes a loop conveyor to deliver heated blanks to a conveyor discharge station on the conveyor. A second conveyor extends from the conveyor discharge station to the loading station of the transfer. A push rod is provided at the conveyor discharge station to move the blank to a lifter mechanism which lifts the blank to a position on the second conveyor. A pusher is movable along the second conveyor from a fully retracted position to push the lifted blank along the second conveyor to the transfer loading station.



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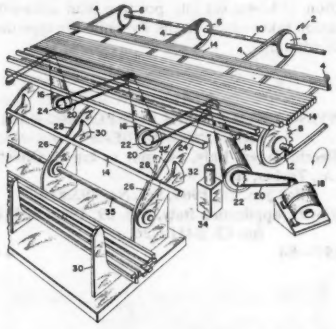
**3,651,921**

**BAR SEPARATOR**

**William J. Hill, Holden, Mass., assignor to Morgan Construction Company, Worcester, Mass.**

**Filed June 17, 1970, Ser. No. 46,969**
**Int. Cl. B65g** *47/26*
**U.S. Cl. 198—34** **11 Claims**



A conveyor for feeding a succession of side by side elongated elements laterally to a group of angularly disposed rotating tapered rollers which receive the elements and accelerate them to open gaps or spaces therebetween while maintaining the elements in parallelism.

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**3,651,922**

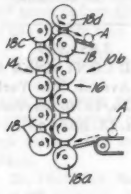
**LIVE ROLLER CONVEYOR FOR DISCRETE ARTICLES SUCH AS FRUIT**

**John M. Ross, Upland, and Warren V. White, Ontario, both of Calif., assignors to Sunkist Growers, Inc., Los Angeles, Calif.**

**Filed Oct. 10, 1969, Ser. No. 866,149**
**Int. Cl. B65g** *13/02*
**U.S. Cl. 198—127** **18 Claims**

A live roller conveyor for discrete articles of varying size and shape, such as fruit, has two sets of laterally spaced resiliently compliant or spongy feed rollers which are arranged and staggered in uniform spaced relation to define an intervening essentially continuous article passage of generally serpentine configuration, the rollers being driven in rotary

directions to feed the articles in one direction through the passage. The conveyor rollers may be used to lower articles from a high level to a low level or to raise the articles from a



low level. The conveyor rollers may also be combined with heating means and blower means to function as a dryer for washed articles.

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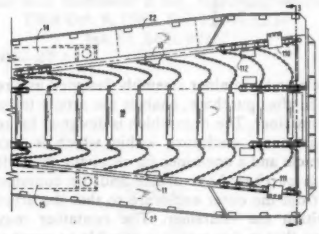
**3,651,923**

**DISCRETE MATERIAL HANDLING APPARATUS**

**Charles M. Anderson, Paris, and Harry G. Boling, Millersburg, both of Ky., assignors to W. R. Corporation, Millersburg, Ky.**

**Filed Jan. 18, 1971, Ser. No. 107,314**
**Int. Cl. B65g** *19/10*
**U.S. Cl. 198—168** **8 Claims**



Apparatus for handling large batch loadings of discrete material and for conveying the same to a discharge station embodies a conveyor having cooperating rigid and flexible flights simultaneously moving the material to the discharge station and while agitating the same.

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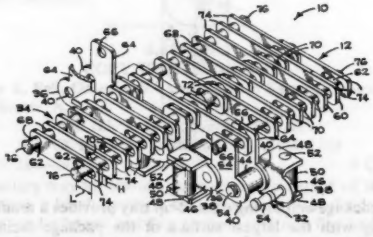
**3,651,924**

**DUAL BEND CONVEYOR**

**Ronald F. Homeier, Plainfield, and Larry E. Richardson, Indianapolis, both of Ind., assignors to FMC Corporation, San Jose, Calif.**

**Filed June 15, 1970, Ser. No. 46,368**
**Int. Cl. B65g** *15/00, 17/00*
**U.S. Cl. 198—189** **6 Claims**



A conveyor capable of bending in vertical and horizontal planes having a central guide and drive chain capable of being driven in two planes and a continuous horizontal carrying surface comprised of multiple load supporting leaves on transverse rods carried by links of the drive chain for relative telescoping motion when the conveyor is bent in horizontal or vertical planes.

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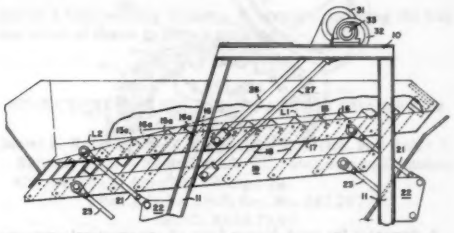
**3,651,925**

**DUAL SHUFFLE FEED**

**Chester Green, San Jose, Calif., assignor to Genevieve I. Hanscom, Saratoga, Calif. and Genevieve I. Hanscom, Robert Magnuson, Lois J. Thomson, as Trustees of the Estate of Roy M. Magnuson, part interest to each**

**Filed Oct. 30, 1969, Ser. No. 872,698**
**Int. Cl. B65g** *25/04*
**U.S. Cl. 198—218** **3 Claims**



This shuffle feed mechanism is a two-part shuffle feed mechanism wherein the portion of the shuffle feed bed adjacent to the feed end is disposed at a steeper working angle to the horizontal than the last portion of the shuffle feed at the discharge end. This allows a desirable angle for the processing of an article on the shuffle feed mechanism adjacent the discharge end, for example, sorting or splitting in half, and also provides a desirable angle of operation on the product to obtain a single line or row of the products in the valleys of the shuffle feed mechanism.

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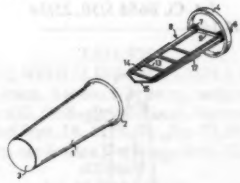
**3,651,926**

**TRANSPORT PACKAGE FOR BACTERIOLOGICAL SPECIMENS**

**Royal Albert Elfast, Jr., Turkosgatan 16, Vastra Frolunda, Sweden**

**Filed Oct. 6, 1969, Ser. No. 863,789**
**Claims priority, application Sweden, Oct. 17, 1968, 14036/68**
**Int. Cl. A45c** *11/00*
**U.S. Cl. 206—1 R** **4 Claims**

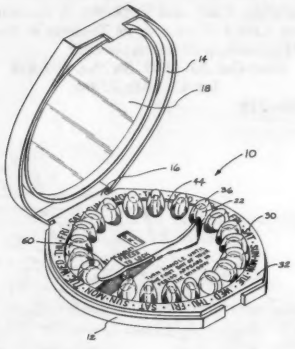


The invention relates to a transport package for bacteriological specimens comprising in combination a transparent vessel in the form of a truncated cone and a tight-fitting twistable lid, an elongated supporting means adapted for carrying substrate being attached to the lid and twistable therewith, the longitudinal edges of the supporting means being provided with wiping members for wiping the inner wall of the vessel when the lid is twisted.

## 3,651,927
## TABLET DISPENSER

James E. Richardson, Weston, and Lawrence M. Sherman, Westport, both of Conn., assignors to Cambridge Research and Development Group, Westport, Conn.

Filed Oct. 21, 1969, Ser. No. 868,173
Int. Cl. B65d *83/04*
U.S. Cl. 206—42 5 Claims

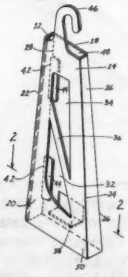


A dispenser for solid dosage form pharmaceutical preparations which are administered on a regular chronologic schedule. Typically, the dispenser is used for the storage and dispensing of oral contraceptive drugs. The dispenser comprises a base disk having a plurality of circumferentially spaced tablet dispenser apertures, an intermediate table disk, having a corresponding plurality of frangible tablet receptacles, and an overlying locator disk. The locator disk also has a corresponding plurality of apertures and, when the three disks are assembled in superposed, operative relation, each tablet receptacle extends upwardly through one of the apertures in the locator disk. Each tablet is oriented in a vertical position within its own tablet receptacle. Appropriate chronologic indicia are positioned on the base disk to permit alignment of the tablet and locator disks to the particular menstrual cycle of the user. Locking means are provided to secure the tablet and locator disks in the desired orientation and superposed relation with respect to the base disk.

## 3,651,928
## DISPLAY CONTAINER

Irving Weisman, Marblehead, Mass., assignor to Interstate Container Corporation, New York, N.Y.

Filed Jan. 21, 1970, Ser. No. 3,532
Int. Cl. B65d *5/50, 25/54*
U.S. Cl. 206—45.14 9 Claims

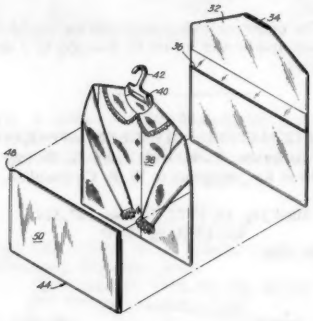


The invention comprises a container for storing and displaying goods, such as a pleated skirt, comprising an open-ended, four walled container having a window area through which the goods may be seen, a hanger part extending beyond the top thereof, and a flap cut out from one of the walls and adapted to prevent the goods from falling through the open-ended bottom of the container.

## 3,651,929
## ARTICLE AND CONTAINER ASSEMBLY

David Stoll, 1199 Park Avenue, New York, N.Y.

Filed Feb. 26, 1970, Ser. No. 14,600
Int. Cl. B65d *65/16*
U.S. Cl. 206—45.33 8 Claims

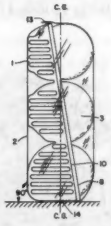


An article and container assembly designed as a retail sales item which, after purchase, enables the article to be situated within a container. The item which is designed for retail sales includes an outer enclosure within which is located any desired article and a container for receiving the article. After this item is purchased the article and the container can be removed from the outer enclosure so that the article can be placed within the container. The container may be gift wrapped so that in this way it is possible to purchase as one assembly both an article and a gift-wrapped container to receive the article.

## 3,651,930
## STAND-UP DISPLAY TRAY AND PACKAGE USING SAME

Kenneth W. Artz, Mohnton, Pa., assignor to W. R. Grace & Co., Duncan, S.C.

Filed June 17, 1970, Ser. No. 46,955
Int. Cl. B65d *65/16*
U.S. Cl. 206—45.33 4 Claims



A package employing a stand-up tray provides a retail shelf display with the largest surface of the package facing the prospective buyer. In this upright position maximum label space or viewing of the package contents is available. The top edges of the sidewalls which define the tray cavity open-

ing are inclined from a taller end wall to a shorter end wall rather than being perpendicular to the end walls. In its vertical position, the tray rests on the taller end wall which is perpendicular to all other walls and edges except the inclined sidewall edges. As a result, the tray cavity's opening is flared for compact nesting of trays before filling while giving a flat supporting surface for the upright tray.

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**3,651,931**

**DISPENSING PACKAGE FOR TWO-PART HAIR-TREATING COMPOSITIONS**

**Du Yung Hsiung, Park Forest, Ill., assignor to The Gillette Company, Boston, Mass.**

**Filed Oct. 28, 1969, Ser. No. 871,941**
**Int. Cl. B65d *81/32***
**U.S. Cl. 206—47 A** **8 Claims**

A package containing a two-part hair or skin treating composition, the parts of which are intended to be mixed immediately before or during dispensing from the package, one part containing hydrogen peroxide and a buffer providing a pH from 2.5 to 6.5, the other part containing alkaline material, the relative amount of acid buffer and alkaline material being such that the pH of the final composition is from 7 to 12 immediately after mixing.

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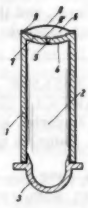
**3,651,932**

**DUPLEX CAPSULE FOR DENTAL FILLING MATERIAL**

**Ernst A. Muhlbauer, Hamburg, Germany, assignor to Zahn-Porzellan KGE Muhbauer & Co., Hamburg, Germany**

**Filed Oct. 9, 1969, Ser. No. 865,124**
**Int. Cl. B65d *81/32***
**U.S. Cl. 206—47 A** **10 Claims**



A capsular container of the duplex type for dental purposes having a substantially rigid container body containing a first component or ingredient and having a perforated wall in which at least one opening is formed to a bag of frangible foil material for receiving a liquid component which when pressed against the perforated wall discharges its contents into the container.

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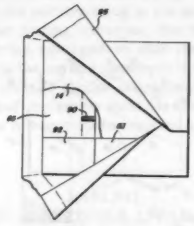
**3,651,933**

**COPY SHEET PACKAGE**

**George E. Bell, Ontario, N.Y., assignor to Xerox Corporation, Rochester, N.Y.**

**Filed July 3, 1969, Ser. No. 839,017**
**Int. Cl. B65h *3/02*; B65d *85/16*; B65h *1/04***
**U.S. Cl. 206—57** **1 Claim**

A unitary tray for storing and dispensing a stack of sheets comprising a blank having a base portion, a lateral side flap portion, and a lateral end flap portion, said side flap and end flap portion being scored to induce folding along parallel lines and having an adhesive thereon to form rectangular support elements on the end and one side of a stack of sheets to be fed, said side support element having secured thereto a plurality of friction pad elements to enable feeding sheets



one at a time without skewing. A wrapper enclosing the tray and stack of sheets to form a package.

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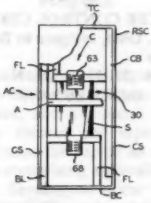
**3,651,934**

**STRUCTURE FOR NESTABLY PACKING CHAIRS FOR SHIPMENT**

**James E. Roberts; Roy L. Miller; Jay V. Welch, and Ralph E. Barrow, all of Winston-Salem, N.C., assignors to Container Corporation of America, Chicago, Ill.**

**Filed July 16, 1969, Ser. No. 842,297**
**Int. Cl. B65d *71/00***
**U.S. Cl. 206—65 R** **2 Claims**




A pair of chairs are nestably packed for shipment with the seats thereof in confronting relationship and spaced by hollow spacing and positioning member having upper and lower panels with flaps extending therefrom in opposite directions and adapted to be folded about the sides of the seat frames and secured thereto. In a form of the invention, one of the chairs to be packed is provided with arms and in such form the positioning member has elements thereof lying between the chair arms and a seat of an armless chair superimposed thereon.

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**3,651,935**

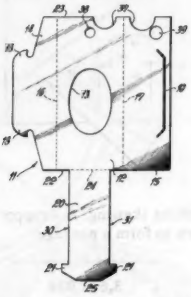
**PACKAGE WITH SLIDEABLE DISPLAY BAND**

**Bernhard P. Nysten, Aachen, Germany, assignor to William Prym-Werke KG, Stolberg/Rhineland, Germany**

**Filed Sept. 18, 1970, Ser. No. 73,354**
**Claims priority, application Germany, Sept. 22, 1969, G 69 37 066.7**
**Int. Cl. B65d *85/24***
**U.S. Cl. 206—66** **15 Claims**

A package for needles and similar rod-shaped articles has an elongated sleeve of predetermined width and a pair of longitudinally spaced open ends. An elongated carrier member is received in the sleeve slidable into and out of one of the open ends by a predetermined maximum distance. An elongated guide flap is of one piece with the sleeve at the opposite end and extends through this opposite end into the interior of the sleeve either towards but short of, or outwardly beyond the one open end. The width of the guide flap is

smaller than that of the carrier member and that of the sleeve itself. Portions of the carrier member are folded about the guide flap so that they embrace the longitudinal margins thereof and abutments are provided on the guide glap adjacent the open end through which the carrier member moves in and out so that the engagement portions of the carrier member abut against the abutment portions when the carrier member is withdrawn to the maximum extent to prevent it from becoming separated from the sleeve.



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**3,651,936**

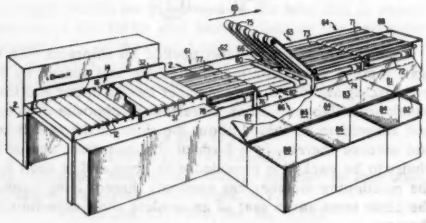
**SORTER CONTROL CIRCUIT**

**Merl Powell, Dayton, Ohio, assignor to Bell and Howell Company, Sidney, Ohio**

**Filed Feb. 27, 1970, Ser. No. 15,076**

**Int. Cl. B07c** *5/00*

**U.S. Cl. 209—74 M** **16 Claims**



A mail weighing and sorting machine directs mail in seriatim from a weighing station along segmented track portions of a main feed track. As each piece of mail is weighed a weight signal is delivered to a control circuit which is operative to cause a selected track segment to intercept the corresponding piece of mail as it travels along the main feed track. The control circuit includes a comparator which produces weight category signals from various stages thereof depending upon the weight of each piece of mail. Each computer output stage is connected to an associated delivery circuit. Each delivery circuit includes means for gating its various weight category signals to a corresponding actuator control, but some of the gated signals are delayed in a primary delay device which provides outputs to both the corresponding actuator control and an AND gate for gating a second weight category signal to a secondary delay device in the event the first delay device is already delaying a first weight category signal.

**3,651,937**

**AUTOMATIC INSPECTION MACHINE**

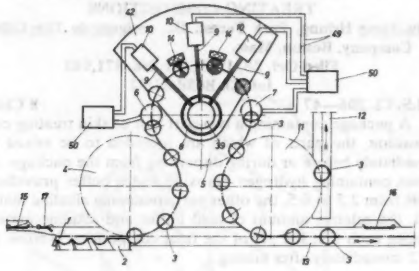
**Hermann Kronseder, Berliner Strasse 10, 8402 Neutraubling, Germany**

**Filed May 4, 1970, Ser. No. 34,113**

**Claims priority, application Germany, May 21, 1969, P 19 22 490.9**

**Int. Cl. B07c** *5/342*

**U.S. Cl. 209—75** **13 Claims**



Apparatus for inspecting empty transparent containers for dirt. The containers are transferred from an inspection star wheel rotor to a separating star wheel rotor. There are separate inspection sensors associated with the inspection rotor for respectively inspecting the side wall, bottom and top lip of the containers. A common dirty bottle segregating mechanism is associated with the separating star wheel rotor and a common regulating unit which responds to the several inspection sensors for selectively actuating the segregating mechanism to segregate dirty from clean containers on the separating rotor. The clean containers leave the separating rotor via a discharge conveyor, and the dirty bottles leave the separating rotor via a reject conveyor.

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**3,651,938**

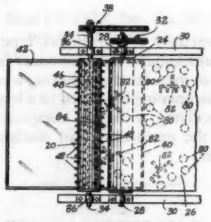
**AUTOMATIC ARTICLE SEGREGATION**

**Fred F. Suellentrop, Jr., Imperial, and Alan A. Suellentrop, Mehlville, both of Mo., assignors to Lemay Machine Company, St. Louis, Mo.**

**Filed May 18, 1970, Ser. No. 38,127**

**Int. Cl. B07b** *13/10*

**U.S. Cl. 209—78** **1 Claim**



Means disposed adjacently to the delivery end of a conveyor for automatically segregating articles being delivered and directing them into separate containers. The primary component of the invention comprises a rotatably mounted cylinder spaced forwardly from the delivery end of the conveyor, and driven in the same direction. As will appear, more than one such cylinder may be employed when more than two different articles are being delivered by the conveyor. The external periphery of such cylinder or cylinders would be provided with a determined pattern of outwardly project-

ing elements, preferably pins pressfitted thereinto or otherwise appropriately mounted thereon, the diameter and length of said pins being variable in contemplation of the articles to be delivered by a conveyor. Likewise, the diameters of the cylinder or cylinders employed in accordance with the concepts of the present invention may be larger or smaller than that of the delivery end roller of the conveyor. Preferably although not necessarily, the cylinder or cylinders of this invention would revolve at approximately the same speed as that of the conveyor delivery end roller.

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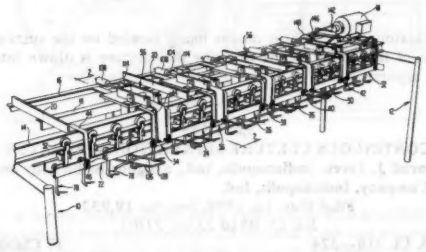
**3,651,939**

## POULTRY SIZER

**Grover S. Harben, Jr., Gainesville; Ernest E. Lewis, Flowery Branch, and Lloyd E. Sloan, Gainesville, all of Ga., assignors to Gainesville Machine Company, Inc., Gainesville, Ga.**

**Filed Aug. 31, 1970, Ser. No. 68,215**
**Int. Cl. B07c** *5/16*
**U.S. Cl. 209—121** **6 Claims**



Apparatus for sizing poultry by weight includes a plurality of spaced weighing stations each of which is responsive to a predetermined and different weight. A series of trolley devices moves the poultry successively through the weighing stations, and ejecting mechanism is associated with each station so that the poultry is ejected at the proper station be weight. In one form of the invention, the arrangement of the weighing beam and counterbalancing weight is such that poultry is ejected whenever its weight exceeds a predetermined limit. In another form of the invention, poultry is ejected only when it is at or about a predetermined weight.

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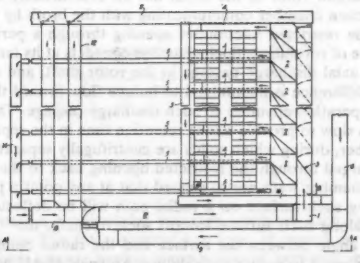
**3,651,940**

## SORTING CONVEYOR ARRANGEMENTS

**Sydney William Rooke, Erith, England, assignor to Sovex, Limited, Kent, England**

**Filed Dec. 19, 1969, Ser. No. 886,665**
**Claims priority, application Great Britain, Dec. 24, 1968, 61,404/68**
**Int. Cl. B07c** *5/36*
**U.S. Cl. 209—125** **14 Claims**



An article sorting arrangement in which articles are fed to one or more sorting stations and from the sorting stations to one or more sorting conveyors, each sorting station including a store in which articles are accumulated after sorting and then fed successively to the sorting conveyor. Each store consists of a number of compartments separated by controllable dividing means, these means being operated in such a way that the articles accumulating in the store travel progressively towards the sorting conveyor, the order of filling the compartments being arranged so that the compartment in each store nearest the sorting conveyor is filled first. The arrangement may include feeder conveyors for supplying the sorting station, and preferably includes means to ensure that articles which are not sorted are recycled until sorting can be effected.

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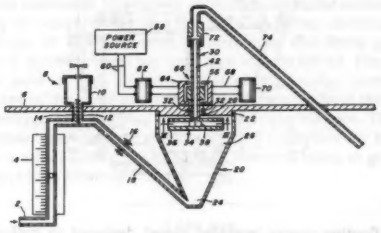
**3,651,941**

## DISC-CENTRIFUGE APPARATUS

**Paul Imris, Springdale, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Mar. 24, 1969, Ser. No. 809,780**
**Int. Cl. B07b** *7/083*
**U.S. Cl. 209—139 R** **2 Claims**




Disclosed is a disc centrifuge having several straight radial passages leading to a central offtake. When the disc is rotated at high speed, and a gaseous stream is led to its periphery, particles therein are separated. The disc is preferably stationed near the top of an elutriation chamber, use of arrangements comprising a plurality of disc-containing chambers is taught. Separations occur with a minimum of line pressure drop. With means for changing the number of passages used and the disc rotational velocity, a "coarse tuning" versus "fine tuning" effect is conveniently obtained.

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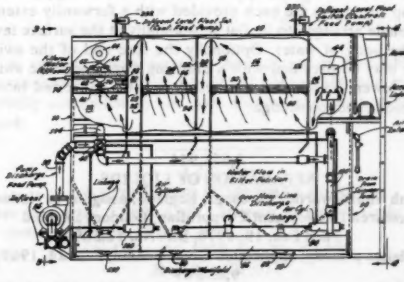
**3,651,942**

## REACTOR FILTER ASSEMBLY

**Martin J. Berardi, 149 N.E. 98th Street, Miami Shores, Fla.**

**Filed June 22, 1970, Ser. No. 47,961**
**Int. Cl. B01d** *29/38, 29/08*
**U.S. Cl. 210—140** **9 Claims**



A reactor filter assembly is provided for purifying water, or other liquids, in an effluent stream, and which is designed,

for example, to have a multistate construction. A four-stage system will be described. The influent to the system is first treated with conditioning chemicals and aerated for oxidation and for the removal of undesired gases. The conditioned liquid is then upflowed to a velocity suspended floculation bed into a first solid retention stage, and the operation may be repeated in a second similar stage. A further stage is then provided for final polishing of the filtered water. Backwash and sludge drainage is provided in the system, and may be automatically controlled so that the entire assembly may be unattended.

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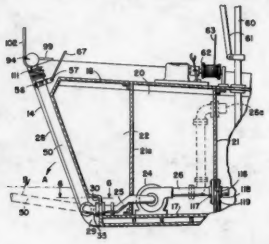
**3,651,943**
**POLLUTION SUCTION WATER SWEEPER**
**James Di Perna, 85 Foxhill Terrace, Staten Island, N.Y.**
**Filed Apr. 13, 1970, Ser. No. 27,653**
**Int. Cl. C02b** *9/02*
**U.S. Cl. 210—242** **1 Claim**



A floating power operated vessel designed to collect by suction from the surface of a body of water, as it moves thereover, floating pollutant matter. Adjacent the prow of the vessel is a suction pump compartment and inlet pipes below the water level connected to a suction pump in the compartment. Adjacent the stern of the vessel is a clean water collecting compartment having a discharge pipe adjacent the top thereof and above the water level for discharging the same downwardly onto the surface of the body of water. Between the forward pump compartment and the rear clear water collecting compartment there is provided a series of transversely disposed and longitudinally spaced partitions forming communicating chambers designed to separate by degrees the mass of pollutant matter from the water.

At least one suction swing pipe is pivotally jointed at the prow of the vessel. Formed in the prow is a recess in which the swing pipe is received when raised to its inoperative position. A winch and derrick on the top deck of the vessel is cable connected to the upper free end of the swing pipe. A scoop structure which may be one of a variety of forms and sizes is attached to the upper free end of the swing pipe. The scoop structures are each provided with a forwardly extending blade arranged to lie flat substantially at the surface level of the body of water. Optionally the free end of the swing pipe may be provided with a dredging nozzle and the swing pipe lowered such that the vessel may be converted into a hydraulic suction dredge.

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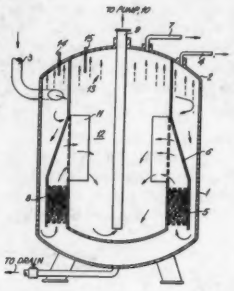
**3,651,944**
**SEPARATION OF LIQUIDS**
**Frank Shuttleworth, Stevenage, England, assignor to National Research Development Corporation, London, England**
**Filed Feb. 19, 1970, Ser. No. 12,569**
**Claims priority, application Great Britain, Feb. 24, 1969, 9,850/69**
**Int. Cl. B01d** *17/02*
**U.S. Cl. 210—265** **7 Claims**

Apparatus for separating a liquid from a stream of another liquid which is immiscible therewith and has a different specific gravity, which apparatus comprises pump means, separator means, and means for feeding the mixture into the



separator, the separator means being located on the suction side of the pump means whereby the mixture is drawn into the separator.

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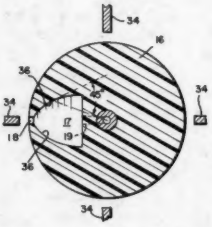
**3,651,945**
**CONTINUOUS CULTURE SEPARATION APPARATUS**
**Conrad J. Feren, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.**
**Filed Mar. 16, 1970, Ser. No. 19,932**
**Int. Cl. B01d** *23/00, 21/02*
**U.S. Cl. 210—324** **17 Claims**



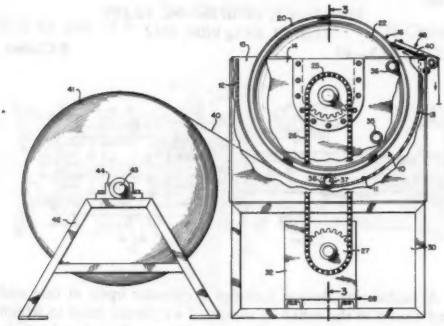
Apparatus for use in a continuous antibiotic production process to continuously withdraw from the culture broth a liquid portion from which growth organisms and solids are separated and left behind in the broth for further production. A separator rotor in the broth has an eccentrically located separation chamber communicating with the broth by way of a single restricted inlet/outlet opening through a peripheral surface of revolution. Such chamber connects at its inner end to an axial discharge passage in the rotor shaft, and a pressure difference is maintained to induce flow inward through the separation chamber to such discharge passage. The flow rate is slow to provide a long retention time in the separation chamber, during which solids are centrifugally separated and discharged through the restricted opening back to the broth. The chamber walls are so shaped that at any point a particle striking such surface on a radial path will be deflected and slide along such surface toward such opening, the "deflection" angle between the surface and the radius being sufficiently small to ensure such sliding. An angle of 45° has been found satisfactory, and angles less than 60° are considered useful.

3,651,946

## ROTARY FILTERS

Harry Ball, Piscataway, and Henry A. Steward, Califon, both of N.J., assignors to Technical Fabricators, Inc., Nutley, N.J.

Filed Dec. 31, 1969, Ser. No. 889,580
Int. Cl. B01d 33/12
U.S. Cl. 210—387 5 Claims



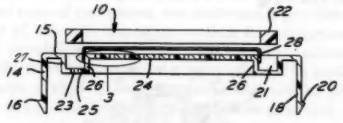
A rotary filter machine has a rotary drum with a perforated peripheral wall supported on a horizontal shaft and extending into a tank adapted to contain slurry to be filtered. A continuous flexible filter paper sheet is continuously led from a source of supply to the drum, wound around the drum so as to travel with the drum through the slurry to be filtered and then stripped from the drum. Suction in the drum draws the liquid from the slurry through the filter paper sheet, and through the perforated peripheral wall of the drum to the interior of the drum and is conducted away from the machine. The solids filtered out of the slurry are entrapped in and on the filter paper sheet and are carried away from the machine with the paper sheet for disposal after stripping from the drum.

3,651,947

## FILTER

George R. Scholhamer, Philadelphia, Pa., assignor to Rudd-Melikian, Inc., Warminster, Bucks County, Pa.

Filed Mar. 11, 1970, Ser. No. 18,570
Int. Cl. B01d 25/04
U.S. Cl. 210—474 3 Claims



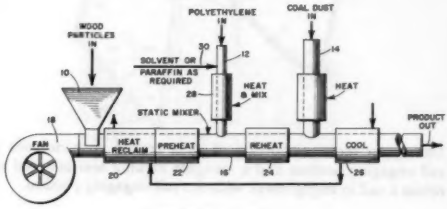
A filter is provided for beverage machines such as coffee machines. The filter material is a layer of woven or molded polymeric plastic having a mesh size of between about 52 and 70 microns. Filter material is supported by a coarse support grid which in turn is supported by a carrier.

3,651,948

## AGGLOMERATED POROUS MASS AND METHOD OF PREPARING SAME

Clinton O. Bunn, Denver, Colo., assignor to Col-Mont Corporation, Butte, Mont.

Filed July 1, 1970, Ser. No. 51,541. The portion of the term of the patent subsequent to Oct. 27, 1987, has been disclaimed.
Int. Cl. B01d 39/04; C02b 9/02
U.S. Cl. 210—502 10 Claims



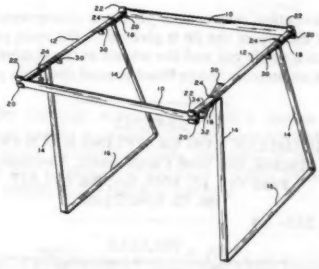

The method of recovering oil leakage from the surface of a body of water, comprising the steps of mixing discrete core particles of wood material, polyethylene and finely ground coal to form particles having a high affinity for oil. The particles have a high degree of integrity, thereby permitting storage of the same at points relatively remote from the point of leakage and airlifting of the same to the oil spot. The oil-saturated particles are processed after collection for further use as a fuel source, with the B.t.u. content being as great or greater than bituminous coal.

3,651,949

## SUPPORT FOR SUSPENDED FILES

Rex D. Carter, Clovis, Calif., and Earl W. Hoffsis, Holland, Ohio, assignors to Sheller-Globe Corporation, Toledo, Ohio

Filed July 27, 1970, Ser. No. 58,331
Int. Cl. A47f 5/10
U.S. Cl. 211—177 6 Claims



A support frame assembly for suspended files which is comprised of a minimal number of components and may be readily assembled by the user without the need of special tools.

3,651,950

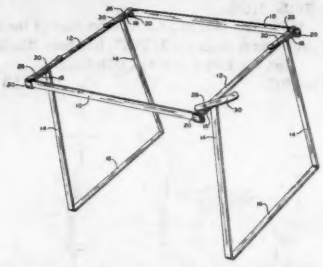
## SUPPORT FOR SUSPENDED FILES

Rex D. Carter, Clovis, Calif., assignor to Sheller-Globe Corporation, Toledo, Ohio

Filed Aug. 11, 1970, Ser. No. 62,885
Int. Cl. A47f 5/10
U.S. Cl. 211—177 6 Claims

A support frame assembly for suspended files which is comprised of a minimal number of components and may be readily assembled by the user without the need of special

tools. The assembly includes a pair of vertical corner posts interconnected by a cross bar at each end of the support frame and rails extending between the ends of the frames.



The upper terminal portion of each corner post includes a rail engaging portion and a movable locking arm adapted to retain a rail in engagement with the rail engaging portion.

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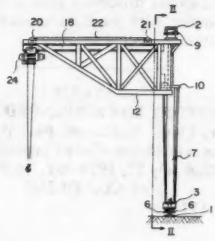
**3,651,951**

**JIB CRANE**

**Sakae Murakami, 382-2 Matsunaga-machi, Fukuyama, Japan**

**Filed Apr. 13, 1970, Ser. No. 27,520**
**Claims priority, application Japan, Feb. 13, 1970, 45/14196**
**Int. Cl. B66c** *23/04*
**U.S. Cl. 212—17** **2 Claims**



This invention relates to a jib crane characterized by the fact that the top of the jib is pivoted to the main post, which travels on a single rail and the wheels at the bottom of the jib travel on an annular flange fitted around the main post.

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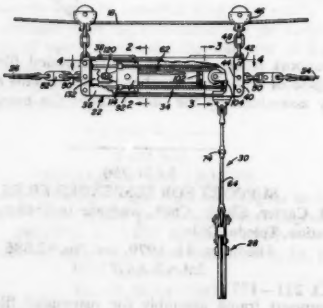
**3,651,952**

**AUTOMATIC LOG GRAPPLING MECHANISM**

**John H. Mitchell, 400 West Curtis Street, Aberdeen, Wash.**

**Filed Nov. 13, 1969, Ser. No. 876,527**
**Int. Cl. B66c** *21/00*
**U.S. Cl. 212—84** **6 Claims**



A grapple assembly swivelly suspended from a skyline carriage is automatically opened and closed by mechanical means located within the carriage. The carriage is moved by in-haul and out-haul cables and through the skyline cable is lowered or raised for yarding logs. Sequential slackening and tensioning of the skyline cable controls the opening and closing of the grapple jaws.

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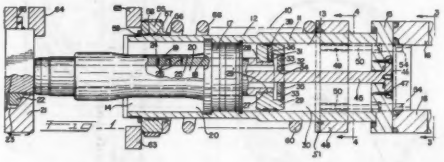
**3,651,953**

**RAILWAY CAR CUSHIONING DEVICE**

**Willis H. Knippel, Palos Park, Ill., and William R. Shaver, Munster, Ind., assignors to Pullman Incorporated, Chicago, Ill.**

**Filed June 1, 1970, Ser. No. 42,109**
**Int. Cl. B61g** *9/08, 9/12*
**U.S. Cl. 213—43** **5 Claims**



A cushioning device includes a cylinder open at one end and closed at the other by means of a cylinder head to which a coupler yoke is connected. An intermediate head within the cylinder is provided with a bore through which a piston rod reciprocates. The piston rod is of hollow construction and with the intermediate cylinder head and a flexible boot provides a low pressure accumulator chamber. The piston rod is threaded into a bore provided in a piston. The piston includes a radial threaded bore which contains an expandable plug rigidly engaging the threads of the rod to lock the piston against rotation. A set screw applies pressure to the plug. The radial bore opens outwardly into an annular recess in the piston circumference which contains a nonmetallic piston ring.

The cushioning cylinder also includes a coil return spring which is held captive at one end by a collar and actuating ring adjacent the cylinder head connected to the yoke. The other end of the spring is held captive by a sliding sleeve having an improved spring seat arrangement. The collar and the first cylinder head are provided with aligned bores which contain pins reciprocably positioned so as to compress the spring and secure cushioning in a draft stroke in which the pins are moved into engagement with stops provided on a center sill.

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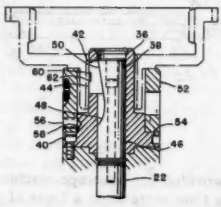
**3,651,954**

**AUTOMATIC LOADING WITH EXPANDING ARBOR**

**Russell W. Anthony, Harper Woods, Mich., assignor to Lear Siegler Inc., Santa Monica, Calif.**

**Filed Apr. 6, 1970, Ser. No. 25,648**
**Int. Cl. B23b** *31/26, 31/40*
**U.S. Cl. 214—1 Q** **6 Claims**



Automatic loading mechanism in which a rotary support includes an expanding arbor. The support is moved between

a loading and a working station and while in the loading station the arbor is in unexpanded condition to permit unloading and loading of work pieces.

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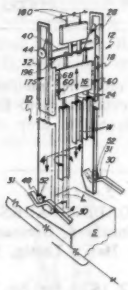
**3,651,955**

## WORKPIECE HANDLING AND PRODUCTION APPARATUS

**Jurek Shkredka, Oakland, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.**

**Filed June 29, 1970, Ser. No. 50,661**
**Int. Cl. B65g** *7/00*
**U.S. Cl. 214—1 P** **23 Claims**



Improved workpiece handling and production apparatus provided with a superstructure and a rack and guide assembly operatively associated therewith for effecting compound movement in and out of a workpiece treating station and orientation of one or more elongated workpieces relative thereto in order to effect selective treatment of a workpiece such as, for example, metal cladding of an I-shaped apertured steel rail member.

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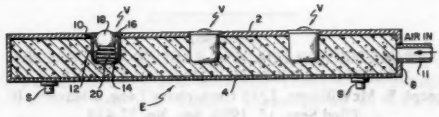
**3,651,956**

## AIR FLOTATION TABLE CONVEYOR

**Andrew T. Kornylak, 400 Heaton Street, Hamilton, Ohio**

**Filed July 16, 1970, Ser. No. 55,404**
**Int. Cl. B65g** *7/06*
**U.S. Cl. 214—1 BE** **3 Claims**




A conveyor for floating an article by air under pressure to provide for ease of movement. An enclosure is provided with a plurality of valves in the upper surface for engagement by the article to release air under pressure from the enclosure to substantially float the article on a layer of air. The enclosure is filled with a rigid open cell porous material to provide structural strength and rigidity for the hollow structure.

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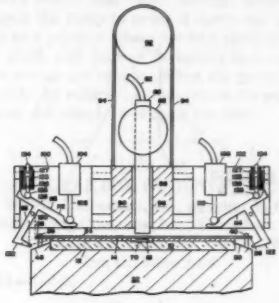
**3,651,957**

## CHIP PACKAGING AND TRANSPORTING APPARATUS

**John F. Ball, Scottsdale, and Rex R. Beatty, Phoenix, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.**

**Filed Mar. 2, 1970, Ser. No. 15,401**
**Int. Cl. B66c** *1/02*
**U.S. Cl. 214—1 BC** **8 Claims**

Means are provided to remove an assembly comprising a frame, a chip and a substrate from the support on which they are assembled. That means comprises moveable fingers which are rotated out of frame contacting position by power



means such as compressed air and which are rotated into the frame contacting position by springs.

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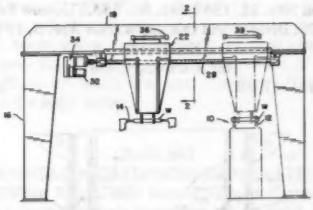
**3,651,958**

## AUTOMATIC LOADING AND TRANSFER EQUIPMENT

**Dewey M. Evans, Farmington, and Peter J. Manetta, Warren, both of Mich., assignors to Simplex Corporation, Detroit, Mich.**

**Filed Sept. 25, 1969, Ser. No. 861,057**
**Int. Cl. B23b** *15/00*
**U.S. Cl. 214—1 BB** **2 Claims**



A transfer carriage movable between a station and a machine tool having a pair of work carriers movable independently along intersecting paths operable to pick up a work piece and to deposit in its place another work piece, both at the station and at the machine tool.

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**3,651,959**

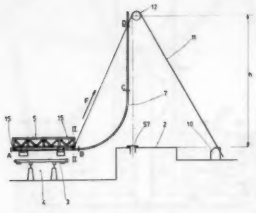
## NEW DEVICE FOR HANDLING ELONGATED MEMBERS

**Andre Castela, Mesnil Le Roi, and Philippe Joubert, Rungis, both of France, assignors to Institut Francais Du Petrole, Des Carburants Et Lubrifiants, Rueil Malmaison (Hauts De Seine), France**

**Filed May 13, 1970, Ser. No. 36,774**
**Claims priority, application France, May 14, 1969, 6915821**
**Int. Cl. E21b** *19/14*
**U.S. Cl. 214—2.5** **11 Claims**

Device for handling rigid elongated members such as drill string elements by transferring the same from a horizontal storage location to a vertical position where they are assembled to the drill string or vice versa, comprising a carriage with gripping means for taking said elements from their storage position and holding them, rollers fastened to said carriage and cooperating with guiding paths, comprising upper rollers for driving the nearest end of said carriage with respect to said vertical position along a first inclined path terminating with a vertical portion in line with said vertical posi-

tion, lower rollers for driving the farthest end of said carriage with respect to said vertical position along a generally horizontal path above the storage location and rollers at an intermediate level taking their bearing on a second inclined



path with a smaller inclination as the first one, for driving an intermediate point of said carriage between said nearest end and said farthest end, substantially to said vertical position when the upper roller reaches said position.

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**3,651,960**

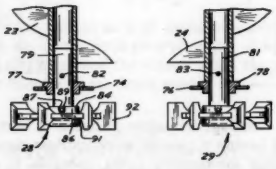
**WALL CLEANER**

**Floyd E. Buschbom, Long Lake, Minn., assignor to Van Dale Corporation, Long Lake, Minn.**

**Original application Dec. 30, 1968, Ser. No. 787,774, now Patent No. 3,522,971, dated Aug. 4, 1970, Original application Nov. 25, 1967, Ser. No. 683,273, now Patent No. 3,460,688. Divided and this application Apr. 3, 1970, Ser. No. 25,524**

**Int. Cl. B65g** *65/38*

**U.S. Cl. 214—17 DB** **11 Claims**



A top unloading silo unloader having a pair of drive hubs for moving a collector arm around the silo. A tie rod extended from the outer end of the collector arm is attached to the drive shaft between the drive hubs by a connector assembly having an arcuate arm cooperating with a guide having a pair of spaced grooves receiving the arm to hold the drive hubs in an adjusted angular position with reference to the collector arm. Each of the drive hubs has circumferentially spaced oppositely directed pairs of radial lugs. Removably and reversibly mounted on the outer ends of the collector arm augers are wall cleaners having forwardly projected teeth.

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**3,651,961**

**SHEET MATERIAL ACCUMULATOR**

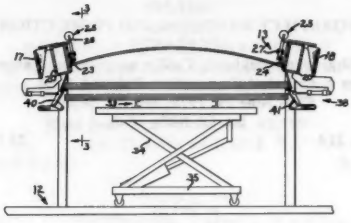
**Leonard L. Hayes, Lewiston, Idaho, assignor to Potlatch Forests, Inc., San Francisco, Calif.**

**Filed Mar. 16, 1970, Ser. No. 19,608**

**Int. Cl. B65g** *57/06*

**U.S. Cl. 214—6 DK** **1 Claim**

A veneer sheet stacking apparatus is described for moving sheets to a stacking station above a receiving platform and then discharging the sheets downward toward the receiving station. An accumulator is positioned on the apparatus for intercepting the descent of the discharged sheets and holding



the sheets above the receiving platform until a desired number of sheets are accumulated to form a bundle. Then the entire bundle is released to drop the bundle onto the receiving station.

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**3,651,962**

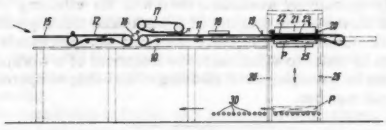
**APPARATUS FOR LOADING SACKS ONTO PALLETS**

**Gerhard Arnemann, Pinneberg, Germany, assignor to Fordertechnik Hamburg Harry Lassig, Muhlendamm, Germany**

**Filed July 2, 1970, Ser. No. 51,975**

**Int. Cl. B65g** *57/10*

**U.S. Cl. 214—6 DK** **5 Claims**



An apparatus for loading sacks onto pallets, comprising conveyor means, sack positioning and flattening devices, sack transfer devices, a retaining bar, a packing plate for forming sack layers, transferring the sack layers onto a pallet, applying an antiskid agent between the sack layers and shaping the sack layers deposited on the pallet, and a lifting platform for the pallets.

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**3,651,963**

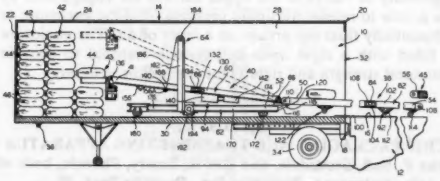
**APPARATUS FOR LOADING BAGGED MAIL FROM A LOADING DOCK INTO A HIGHWAY VEHICLE**

**Joseph E. McWilliams, 1345 Canterbury Lane, Glenview, Ill.**

**Filed Sept. 15, 1970, Ser. No. 72,428**

**Int. Cl. B65g** *67/08, 57/112*

**U.S. Cl. 214—6 G** **7 Claims**



The invention relates to the loading of mail bags from a loading dock into an end loading highway vehicle to fully load the vehicle with compactly formed tiers, in which a pair of tandem connected run back conveyors are mounted on

the loading dock for running under existing mail bag handling conveyors, that are proportioned lengthwise, and are mounted to be moved into the vehicle for loading purposes, to extend between the existing conveyor and the desired unloading point of the bags within the vehicle. The bags are moved single file down the conveyors, with the leading conveyor end being tiltable upwardly about an axis between the conveyor ends and carrying a transversely movable reversibly driven load discharge conveyor apparatus, whereby the bags may be discharged to either side of the vehicle to form compact vertical mail bag stacks up to the full height of the vehicle.

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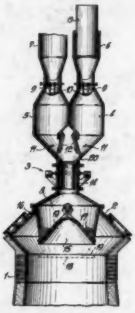
**3,651,964**

**DEVICE FOR DISTRIBUTING MATERIAL INTO A FURNACE**

**Pieter Hendrik Nieboer, Kapellen B. Moers, Germany, assignor to Demag AG, Duisburg, Germany**

**Filed June 16, 1969, Ser. No. 833,545**
**Claims priority, application Germany, Aug. 17, 1968, P 17 58 840.8**
**Int. Cl. F27b *11/12***
**U.S. Cl. 214—36** **13 Claims**



A device for uniformly distributing material into a blast furnace and the like is formed by a hopper arranged to supply the material into a distributor pipe. The pipe is supported by pivot means at its upper end so that it can be displaced laterally below its upper end and swiveled about its normal vertical axis for selectively spreading the material into the furnace. The distributor pipe is moved laterally by means of rams actuated by hydraulic piston assemblies.

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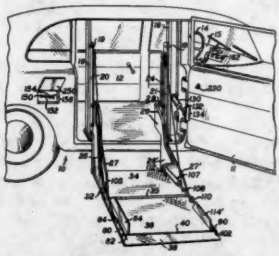
**3,651,965**

**WHEEL CHAIR RAMP FOR AUTOMOTIVE VEHICLES**

**Le Roy S. Simonelli, East Rochester; Leonard N. Randolph, Rushford, and Sam Damico, Rochester, all of N.Y., assignors to Clover Industries, Inc., North Chili, N.Y.**

**Filed May 1, 1970, Ser. No. 33,632**
**Int. Cl. B60p *1/46***
**U.S. Cl. 214—75 R** **6 Claims**



This ramp is adapted to be permanently secured to a vehicle. Two stanchions are fixed at the two sides of a door of the vehicle. Two levers, which are pivoted at their lower ends to the stanchions carry a floor section of the ramp. To this section is hinged a second floor section; and to this second floor section is hinged the step plate or lip of the ramp. Fluid-pressure-operated pistons and cables through manually operated switches open the ramp to swing it down out of the door of the vehicle to a position where a wheel chair patient can roll his or her chain with himself or herself in it onto the ramp and into or out of the vehicle. When the patient is safely inside or outside the vehicle he can operate the switches to fold the ramp into the vehicle, and close the door.

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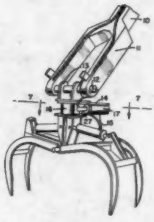
**3,651,966**

**CANE GRAB FOR WINDROW LOADER**

**Harold A. Willett, Thibodaux, La., assignor to Cane Machinery & Engineering Company, Inc., Thibodaux, La.**

**Filed June 11, 1970, Ser. No. 45,380**
**Int. Cl. B66c *3/04***
**U.S. Cl. 214—147 G** **1 Claim**



For Windrow Cane in which the cut canes are haphazardly deposited on the flat field (there being no hills). The suspending mechanism for the grab is mounted to rotate on the upper boom about a substantially vertical axis whereby the grab jaws may be made to open lengthwise or crosswise of the vehicle on which the cut canes are deposited for transfer to the sugar house.

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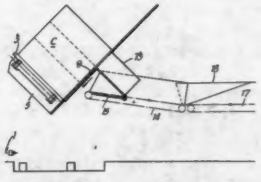
**3,651,967**

**CONTAINER-UNLOADING APPARATUS**

**Sydney William Rooke, and Ronald Francis Coston, both of Kent, England, assignors to Sovex Limited, Erith, Kent, England**

**Filed Feb. 17, 1970, Ser. No. 11,956**
**Claims priority, application Great Britain, Mar. 7, 1969, 12,187/69**
**Int. Cl. B65b *21/02***
**U.S. Cl. 214—307** **5 Claims**



According to the present invention, there is provided an apparatus for unloading the contents of containers, particularly but not exclusively luggage containers used in aircraft. The apparatus comprises a decanter apparatus for tilting each container towards an open side thereof at a discharge station and a fence arranged to hold back the contents of at least one region of said container until the contents of at least one other region have been discharged as a result of the

tilting, the fence being arranged for relative vertical movement with respect to said open side to permit discharge of the regions of said container in a predetermined order. Advantageously, a conveyor onto which the said contents are thus discharged is arranged to be lowered in conjunction with the said fence and with a chute projecting from and aligned with the upper edge of the fence. The containers may be placed in turn on the decanter apparatus in the upright position and then tilted towards an open side of the container against a fence which is arranged initially to close the open side except for the upper part thereof, and is then moved downwardly towards the container base thus permitting progressive discharge of the container. Alternatively the fence and chute form a part of the decanter apparatus and are tilted into the discharge attitude with the container, which is then moved upwards past the fence.

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**3,651,968**

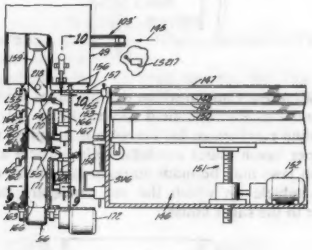
**APPARATUS FOR UNLOADING TIERED ROWS OF ARTICLES FROM CELLULAR CONTAINERS**

**Keith B. Cleland, Azusa, Calif., assignor to Hunter Industries, Inc., Santa Fe Springs, Calif.**

**Original application Dec. 27, 1966, Ser. No. 604,849, now abandoned. Divided and this application Mar. 20, 1969, Ser. No. 823,230**

**Int. Cl. B65g *59/06***

**U.S. Cl. 214—307** **2 Claims**



A method of and apparatus for positively holding, and loading and unloading articles such as large empty, light weight, square, slippery plastic milk bottles into and out of a magazine so that they do not jam the handling apparatus. Typically the bottles, after molding, may sometimes be made at the place of business of a plastic manufacturer and used at some other location. The light weight resilience, and slippery surface of empty plastic milk bottles make them extremely difficult to handle. This difficulty is overcome through the use of the present invention in that movement of each bottle is positively guided and handled throughout the entire handling apparatus.

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**3,651,969**

**COMBINATION HOUSE AND AUXILIARY TRAILER APPARATUS**

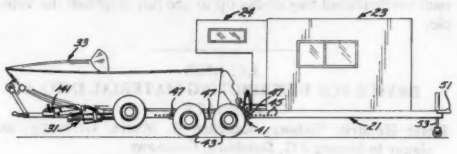
**Sherman H. Bledsoe, P.O. Box 1144, Cottonwood, Ariz.**

**Filed Sept. 16, 1970, Ser. No. 72,583**

**Int. Cl. B60p *3/36***

**U.S. Cl. 214—515** **13 Claims**

Combination house and auxiliary trailer apparatus including a frame carried on a pair of wheels and having a main closure mounted thereon. A pair of spaced apart tracks project rearwardly from the main closure and an extendible closure is carried thereon for telescopical receipt in such main closure. An auxiliary trailer is provided with a rear portion that is receivable between such tracks and includes a pair of support wheels and retraction means for retracting such support wheels to an elevated position. Coupling means is provided for coupling the auxiliary trailer to the rear portion of the house trailer whereby the extendible closure may be moved to its retracted position in the main closure and the auxiliary trailer moved into position with its rear portion extending between the tracks. The auxiliary trailer may then be coupled to the house trailer and its support wheels elevated to enable the combination to be towed as a unit from the tongue of the house trailer. When the destination is reached, the retractable wheels may be lowered and the auxiliary trailer uncoupled from the house trailer to thereby free such auxiliary trailer for use independent of the house trailer and enable the extendible closure to be moved rearwardly on the tracks to cooperate with the main closure in providing a composite closed area.



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**3,651,970**

**MOTOR DRIVEN VEHICULAR CHASSIS AND LOAD CARRYING PLATFORM OR CONTAINER FOR TRANSPORT THEREBY**

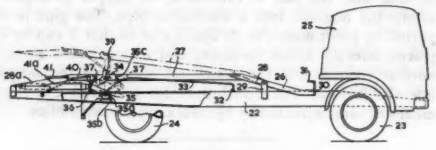
**Drummond Steen Poyner Black, 25 Clark Avenue, Edinburgh, 5, Scotland**

**Filed Sept. 15, 1970, Ser. No. 72,787**

**Claims priority, application Great Britain, Sept. 22, 1969, 46,491/69**

**Int. Cl. B60p *1/64***

**U.S. Cl. 214—515** **4 Claims**



The invention consists in the combination of a motor driven chassis and a platform having front and rear supporting legs with releasable struts. The legs are hingedly secured to the platform and the latter is provided with rollers at its forward end and towards its rear end is provided with a combination of fixed and movable pulleys together with cable trained over the pulleys and anchored to the rear legs and to a fixture.

The chassis is provided with rails extending along the chassis girders, the rails being pivoted to the girders towards their forward ends and forming downwardly inclined ramps at their rear ends. The chassis is further provided with a pair of toggles operated by a hydraulic piston and cylinder assembly and having hooklike members. When the chassis is backed below a free standing platform the rollers cooperate with the ramps and run on the rails, the front end of the platform is raised, the struts of the front legs are released and said legs are folded upwardly and rearwardly, the toggles are then operated to raise the rails, to cause the hooklike members to lock the platform to the chassis and to move the movable

pulleys so that the cables release the struts of the rear legs which are folded upwardly and inwardly, further movement of the toggles lowering the platform and the rails. By reversing the movement of the piston the cycle of operations is reversed to leave the platform free standing.

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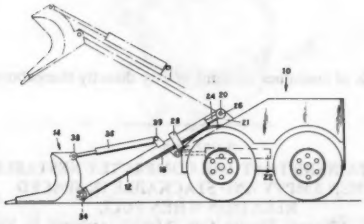
**3,651,971**
**SIDE AND END TIPPING LOADING MACHINES**

**Allan S. McGuinness, Johannesburg, South Africa, assignor to Maconomy (Proprietary) Limited, Johannesburg, South Africa**

**Filed Sept. 30, 1969, Ser. No. 862,414**
**Claims priority, application South Africa, Sept. 30, 1968, Jan. 3, 1969; 68/6311, 69/0053**
**Int. Cl. E02f** *3/84*
**U.S. Cl. 214—768** **9 Claims**



A loading machine consisting of a wheeled chassis and two arms pivoted at their rear ends to the chassis. The arms are so connected to the chassis that they are independently capable of vertical and limited horizontal movement. A bucket is pivotally connected with limited universal movement to the front ends of the arms. The arms can be raised or lowered together hydraulically. Hydraulic jacks which extend between the arms and the bucket when operated separately or to different extents cause the forward end of the appropriate arm to sweep through a curve towards the vertical plane containing the other arm causing the bucket to pivot about the other arm.

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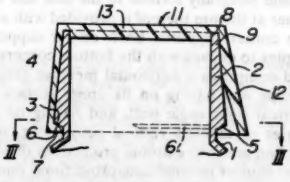
**3,651,972**
**CAP**

**Mimpei Itoh, 8-10 Nishi-Tsuruma-2-chome, Yamato, Japan**

**Filed Dec. 8, 1970, Ser. No. 96,073**
**Claims priority, application Japan, Jan. 14, 1970, Sept. 5, 1970; 45/4672, 45/88593**
**Int. Cl. B65d** *41/22*
**U.S. Cl. 215—41** **8 Claims**



A cap of elastic material for use in combination with a neck portion of hard material having an annular projection or ridge formed in the lower portion thereof has the hollow lower portion or skirt whose cross section is elliptical or polygonal such as triangular, square and the like. A bow-shaped or crescent-like recess is formed in the inner surface of the hollow skirt portion for engagement with the annular projection or ridge when the cap is fitted over the neck portion. The cap may be readily released from the neck portion just by applying the pressure to the skirt portion without any rotation of the cap. The neck portion may have a top wall having an opening while the cap has an opening formed through its top wall so that upon rotation of a slight amount of the cap the container is ready to dispense the contents thereof without removing the cap.

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**3,651,973**
**NURSING BOTTLE**

**Akira Yamauchi, 121 Tatsumachi, Sasayama-cho, Taki-gun, Japan**

**Filed Mar. 30, 1970, Ser. No. 23,681**
**Claims priority, application Japan, Apr. 7, 1969, 44/31511**
**Int. Cl. A61j** *9/00, 11/00*
**U.S. Cl. 215—11 B** **6 Claims**

A nursing bottle assembly including a composite bottle shell including an outer main body, a collapsible milk bag to be placed therein, a nipple provided with a special nonreturn outlet and an inner bottom member adapted to be moved slidably upward or downward by being telescopically guided by the main body. After the nipple and the milk bag containing milk are secured by a fastening ring to the mouth of the body with the opening end of the bag folded over the mouth, the bottom member is moved upward to force out the air in the bag and fill the interior of the specially constructed nipple with the milk. Due to the provision of the particular nonreturn structure of the milk outlet, inflow of air is prevented to keep the milk retained in the nipple all the time for smooth sucking action.

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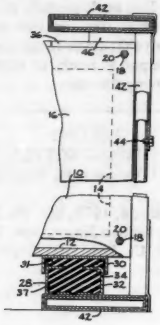
**3,651,974**
**CONTAINER**

**Daniel J. Barry, 3321 Mt. McKinley Drive, San Jose, Calif., and James J. McNeill, 2650 California Street, Mountain View, Calif.**

**Filed July 7, 1969, Ser. No. 839,559**
**Int. Cl. B65d** *87/00*
**U.S. Cl. 220—1.5** **1 Claim**

A shipping container in the form of one or more separate enclosures releasably supported in assembled relation by a unitizing frame adapted for containerized shipping

techniques, each enclosure having an access opening closeable by a door in hermetically sealed relation, and incorporating shock absorbent legs and interior tiedown members for cargo protection.



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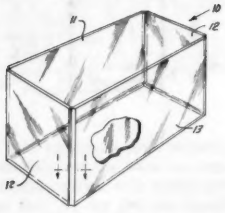
**3,651,975**
**CONTAINER AND JOINT THEREFOR**
**Jerry C. Callan, 2406 N. Henderson, Dallas, Tex.**
**Filed Mar. 9, 1970, Ser. No. 17,766**
**Int. Cl. B65d** *13/02, 64/00*
**U.S. Cl. 220—4 R** **9 Claims**



A container, preferably formed of glass for uses such as aquariums and small animal housings, having panels interconnected along joints formed by securing adjacent panel surfaces together with a plastic adhesive fillet which forms securing corner structure permitting substantial relative movement between the panels while maintaining the fluid tight integrity of the joints.

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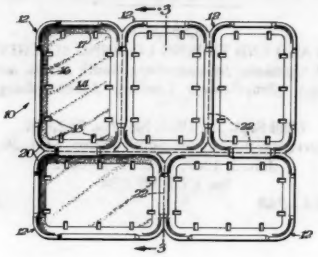
**3,651,976**
**MOLDED PACKAGING TRAY**
**Gilbert R. Chadbourne, Oakland, Maine, assignor to Keyes Fibre Company, Waterville, Maine**
**Filed Apr. 1, 1970, Ser. No. 24,493**
**Int. Cl. B65d** *21/04, 1/34*
**U.S. Cl. 220—23.4** **2 Claims**

Molded packaging tray nestable with like tray comprises plurality of interconnected elongate container sections. Each container section has bottom wall with upwardly and outwardly flaring side and end walls connected thereto. Outwardly extending marginal rim is at top of side and end walls of each section. Weakened tear lines along selected portions of marginal rims in area where container sections are connected together enable individual container sections to be separated from one another. Trays are arranged for stacking one above the other with alternate trays oriented differently from adjacent ones. Marginal rims of each tray support bottom walls of container sections of tray directly thereabove in stack.



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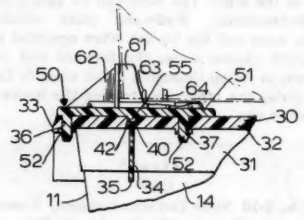
**3,651,977**
**CONTAINERS THAT ARE COMPACTLY NESTABLE WHEN EMPTY AND STACKABLE IN SPACED RELATION WHEN FULL**
**Henry Z. Morgan, Mexico City, Mexico, assignor to Visual Container Corporation, Beverly Hills, Calif.**
**Filed Sept. 15, 1970, Ser. No. 72,283**
**Int. Cl. B65d** *21/06, 1/24, 1/36*
**U.S. Cl. 220—97 B** **3 Claims**

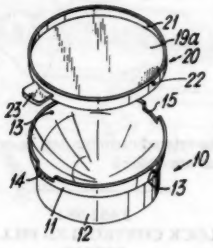


A container that stacks compactly with like containers when empty and that stacks with them when filled in a way that protects the contents of each container. A facia rim continuous with and integrally formed to the side and end walls of the container at the top thereof is provided with a plurality of removable corner supports. Each corner supports comprises an adapter to engage with the bottom corners of a like container and comprises a horizontal member generally triangular in shape and having on its upper surface an inset generally vertical right angle wall, and having on its lower surface a series of tapered vertical projections, namely, a corner projection and two extreme projections of substantial length and two shorter intermediate projections, one between the corner projection and each extreme projection. Each facia rim has a corresponding series of receptacles, namely, a through opening at the corner to receive the corner projection, a through opening spaced from the corner to receive each extreme projections, and a dead end socket having an end bearing wall to receive the shorter projections so that they can rest in and upon it.

## 3,651,978
## CONTAINER WITH PIVOTED CONTENTS-REMOVING COVER

Irvine Everard White, Burton Joyce, England, assignor to Illingsworths (Plastics) Limited, Sutton-in-Ashfield, England

Filed Mar. 12, 1970, Ser. No. 18,901
Claims priority, application Great Britain, July 8, 1969, 34,254/69; Apr. 2, 1969, 17,268/69
Int. Cl. B65d *43/16*
U.S. Cl. 220—30 15 Claims

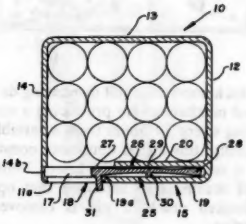



A lidded container comprising a segmental body portion and a lid pivoted thereto, the lid having an innermost planar surface and wherein when the lid is moved through 180° the innermost planar surface will sweep the inner surface of the body portion and remove the contents therefrom and present them for use upon the inverted lid of the container.

## 3,651,979
## TABLET CONTAINER WITH CLOSURE ELEMENT

Kermit H. Severson, P.O. Box 306, Frazee, Minn.

Filed July 10, 1970, Ser. No. 53,802
Int. Cl. B65d *43/20, 83/04*
U.S. Cl. 220—41 5 Claims




A container for tablets and the like including a generally flat tablet retaining portion having one side thereof provided with a tablet dispensing opening with track means arranged adjacent thereto to slidably hold a cover element therein to permit shifting of the cover element into open and closed position across said tablet dispensing opening; said closure element having self-locking and spring loaded characteristics, including a shape to permit retraction of a locking portion thereof into the track area to provide a constant holding against portions of the track area, and when sifted into the closed position, to close the dispensing opening by forcing portions of the cover element into locking position to prevent accidental opening of the tablet dispensing area.

## 3,651,980
## BEAD CLIP RETAINER FOR CAN CLOSURE

Herbert Arthur Bly, P.O. Box 57, South Plainfield, N.J.

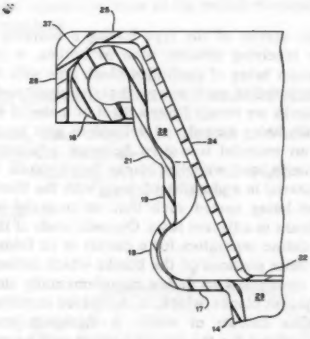
Filed Aug. 19, 1970, Ser. No. 65,141
Int. Cl. B65d *17/24*
U.S. Cl. 220—54 4 Claims

A retainer clip of specified "C"-shape attached to or formed as an integral part of the ring portion of the ring-and-tear-strip opening device commonly used on beverage cans, for the purpose of affixing the ring-and-tear-strip closure to the outer portion of the can rim bead, after removal from the can, thereby conveniently disposing of said closure.

## 3,651,981
## COMBINED CONTAINER AND CLOSURE

Alfred W. Kinney, Kansas City, Mo., assignor to Phillips Petroleum Company

Filed Feb. 5, 1970, Ser. No. 8,959
Int. Cl. B65d *43/10, 51/16*
U.S. Cl. 220—60 R 9 Claims




A container having a closure retention groove is combined with a closure having a retention bead. The closure is formed so that the portion of the closure between the closure rim and the retention bead grips the portion of the container between the retention groove and the container rim to secure the closure to the container and to form a sanitary seal along the container rim. The retention bead can be interrupted at spaced locations to provide continuous fluid access between the packaging space and the annular space between the closure side wall and the corresponding portion of the container. Indentations can be formed at the junction of the rim

and outer skirt of the closure to act as camming surfaces against the curvature of the container rim to raise the closure rim up from the container rim whenever excessive pressure occurs in the container, to thereby vent the container.

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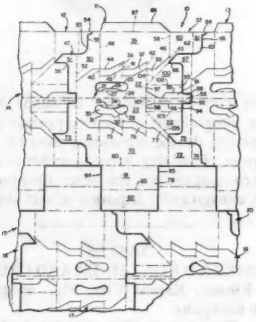
**3,651,982**
**BOTTLE CARRIER**
**Julian B. Slevin, 300-14 East Baltimore Avenue, Lansdowne, Pa.**
**Filed Mar. 5, 1970, Ser. No. 16,731**
**Int. Cl. B65d** *75/00*
**U.S. Cl. 220—111** **13 Claims**



An article carrier of the type having a plurality of cells therein for receiving articles, such as bottles, is provided, with the carrier being of the folded blank type with the blank being constructed in such a way that a plurality of serially disposed blanks are struck from a sheet of material with ends of the blanks being nested and defined in part by cut lines, such that no material is wasted between adjacent serially disposed blanks, and with the blanks being struck from the sheet of material in a plurality of rows, with the blanks in adjacent rows being nested such that no material is wasted between blanks in adjacent rows. Opposite ends of the blanks are cut to define separators for a carrier in its folded condition, with those portions of the blanks which define separators being configured to define complementally shaped cutouts in adjacent blanks, which, in the folded condition of the carrier define cutouts or voids. A minimum amount of material is utilized for the carrier bottom wall to enable the nesting of adjacent blanks in the same row along the blank-forming material.

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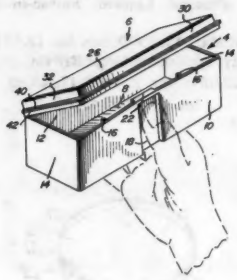
**3,651,983**
**NEGATIVE CONTAINER**
**John M. Haugen, 2421 Hewitt Avenue, Everett, Wash.**
**Filed May 22, 1970, Ser. No. 39,651**
**Int. Cl. B65d** *45/20, 43/16*
**U.S. Cl. 220—315** **3 Claims**

A plastic container expressly designed and adapted for use by customers of a photo-developing and finishing establishment and which serves to protectively store negative. It is amply spacious and constitutes a compact and convenient filing case for the negatives and such other suitably marked and dated media as the user desires to protectively store therein.



Accordingly, the related contents can be orderly grouped for such purposes as are desired.

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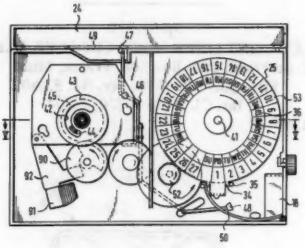
**3,651,984**
**ALARM CLOCK CONTROLLED PILL DISPENSING DEVICE**
**Friedrich Redenbach, In den Moorarkern 3, Ludwigshafen, Rhine, Germany**
**Continuation-in-part of application Ser. No. 851,178, Aug. 19, 1969, now abandoned. This application Nov. 5, 1969, Ser. No. 874,286**
**Int. Cl. B65g** *29/00*
**U.S. Cl. 221—3** **7 Claims**



An alarm clock controlled pill dispensing device comprises an alarm signal mechanism for producing a continuing alarm signal beginning every 24 hours from a settable time. Unless shut off manually, this signal continues constantly or intermittently for a set fraction of 24 hours. Manually operable signal shut-off means is so arranged that operating access thereto is blocked unless a pill is removed from a pill dispensing station.

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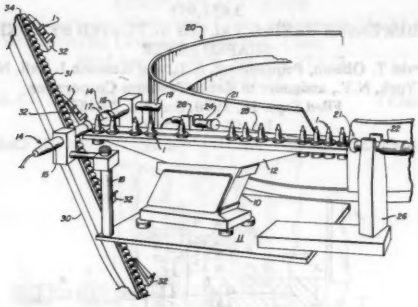
**3,651,985**
**FEEDER CONTROL AND METHOD**
**Floyd E. Smith, 5704 Brewster Lane, Erie, Pa.**
**Filed Dec. 7, 1970, Ser. No. 95,473**
**Int. Cl. G07f** *11/00;* **B65g** *43/08*
**U.S. Cl. 221—10** **10 Claims**

A feeder is disclosed in which a supply feeder delivers frangible parts to a linear feeder. The control is achieved by slaving the supply feeder to the linear feeder, and controlling the number of parts on the linear feeder as a master with the supply feeder as slave. An interrupted beam control is positioned to determine the infeed from the supply feeder to the linear feeder, the linear feeder being controlled by another beam interruption control at its delivering end. The parts are

delivered to a finite position, illustrated for pick up by a conveyor having a plurality of buckets on a chain. The control shuts off the slave supply feeder upon a predetermined time delay after parts pass through the beam. The supply feeder is then activated again after the parts blockage is removed. For purposes of illustration, the supply feeder is a vibratory bowl feeder and the linear feeder is a vibratory linear feeder.



The method contemplates feeding the parts to the linear feeder from the slave supply feeder shutting the same off upon a predetermined time delay after a signal. The signal is a function of continuous parts blockage of a sensor, which is reactivated responsive to the absence of parts blockage, the method of controlling the linear feeder being solely the function of positioning of parts at its delivery end.

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**3,651,986**

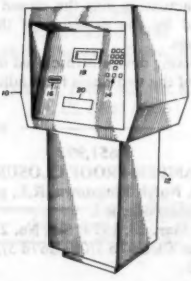
**CREDIT CARD AUTOMATIC CURRENCY DISPENSER**

**Marion R. Karecki, and Thomas R. Barnes, both of Dallas, Tex., assignors to Docutel Corporation, Dallas, Tex.**

**Filed July 29, 1970, Ser. No. 59,156**

**Int. Cl. G07f 7/02**

**U.S. Cl. 221—12** **21 Claims**



A currency dispenser automatically delivers a medium of exchange in packets in response to a coded credit card presented thereto. The coded credit card is presented to the currency dispenser and an initial check is made to determine if the card has the proper format. After checking the credit card format, coded information thereon is evaluated to check the user's identity prior to authorizing him to receive cash from the machine. When each of several additional checks of the credit card code have been completed, the old code is removed and substituted with a new code. The new code contains the same information as the old but updated to reflect an additional currency dispensing transaction. Both the original code and the updated code are scrambled in accordance with a changing key. Scrambling the credit card code after each use thereof minimizes the chance of unauthorized use of the currency dispenser. When the checks of the credit card code indicate the user is entitled to receive the amount of currency he has selected, a storage container for the packets of currency transports the required number of packets by a positive feed drive to a cash drawer. The cash drawer opens to a detent position which allows the customer to then move the drawer to a fully open position to remove his currency. Upon release of the cash drawer, it returns to a partially opened position from which it automatically closes after a preset time limit.

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**3,651,987**

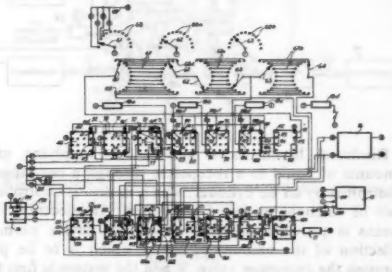
**AUTOMATIC CONTROL FOR DISPENSING MACHINE**

**Cyril E. Powell, Rathfarnham, Ireland, assignor to Consolidated Coin Company (Ireland) Limited, Dublin, Ireland**

**Filed Jan. 2, 1969, Ser. No. 788,484**

**Int. Cl. G07f 11/00**

**U.S. Cl. 221—13** **6 Claims**



A gaming and/or vending machine, which is actuated by the insertion of a coin or note, and comprising a plurality of switch elements and electrical conductors which are movable relative to the switch elements when the machine is in use, actuation of the machine dispensing unit being determined by the final relative position of the switch elements and electrical conductors.

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**3,651,988**

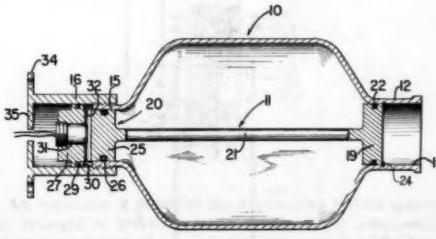
**EXPLOSIVELY OPERATED GAS SUPPLYING APPARATUS**

**John Cirillo, Glen Ridge, N.J., assignor to Walter Kidde & Company, Inc., Belleville, N.J.**

**Filed Aug. 21, 1970, Ser. No. 66,014**

**Int. Cl. B67b 7/02**

**U.S. Cl. 222—3** **10 Claims**



Apparatus for supplying pressurized gas including a container having an outlet opening and an open ended tubular section providing a second opening aligned with the outlet, and a valving device for sealing both openings. The valving

device comprises a piston which is held in sealing relationship with the outlet by the pressure in the container and a second piston positioned in the tubular section for partially balancing the pressure acting on the fist piston. The second piston carries an explosive charge and a piston surface to be acted upon by the gas generated by the explosive. Detonation of the explosive charge drives the valving device into an open position.

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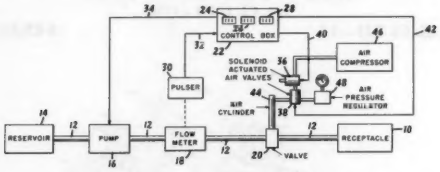
**3,651,989**

**LIQUID METERING SYSTEM**

**Milton D. Westrich, 19 North Harrison Street, South Orange, N.J.**

**Filed Mar. 24, 1970, Ser. No. 22,228**
**Int. Cl. B67d** *5/30*
**U.S. Cl. 222—14** **6 Claims**




Disclosed herein is a system for supplying metered amounts of liquid to a receptacle through a two-stage valve controlled by an air cylinder, which in turn is controlled by a pair of solenoid operated air valves. An electrical control means is provided wherein a selector device permits the selection of the amount of liquid which is to be pumped through the two-stage valve. When the system is first turned-on, the control means provides an electrical signal to one of the solenoids to fully open the two-stage valve. Then, shortly before the completion of pumping of the predetermined amount of liquid, a second electrical signal is coupled from the control means to the second solenoid valve causing the two-stage valve to partially close. Finally, when the full metered amount of liquid has been pumped through the valve, both solenoids are deenergized thereby closing the two-stage valve.

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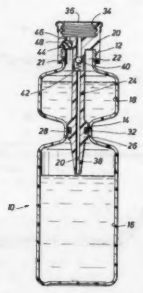
**3,651,990**

**CONTAINER FOR KEEPING LIQUIDS IN SEPARATE CONDITION AND COMMINGLING AND DISPENSING THE SAME**

**Edward J. Cernei, 2148 West Holcombe, Houston, Tex.**

**Filed Oct. 23, 1969, Ser. No. 868,812**
**Int. Cl. B65d** *35/22*
**U.S. Cl. 222—94** **7 Claims**



A container of the plastic "squeeze bottle" type having two compartments which are in communication through a reduced neck portion or restriction which is closed by a tubular stem on a screw cap when the bottle is closed thereby to keep two liquid components separated until they are to be commingled at the time of dispensing. When the liquids are to be dispensed, the cap is removed and reversed to open the reduced neck portion to allow the liquids to become commingled, whereupon the resultant mixture may be dispensed through the stem of the cap by squeezing the container.

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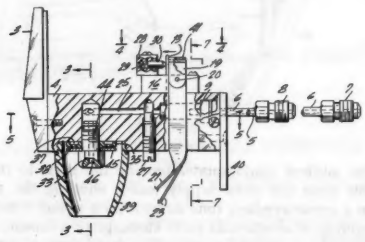
**3,651,991**

**DISPENSER HAVING VALVES ACTUATED BY YOKE SHAPED LEVER**

**Arvid T. Ohlson, Pequannock, N.J., and Kenneth I. Tall, New York, N.Y., assignors to Kenco Products Corporation**

**Filed Sept. 18, 1970, Ser. No. 73,455**
**Int. Cl. B67d** *5/56*
**U.S. Cl. 222—144.5** **32 Claims**



A dispensing device for beverages consisting of two fluids wherein both are to be dispensed substantially simultaneously, comprising a pair of fluid lines with a valve in each one, each valve having an actuating means, the actuating means consisting of a yoke mounted on the body of the device and adapted for pivoting motion with respect thereto. The yoke has an upper portion which bears against the actuating means when said yoke is pivoted to cause the valve to open. A second yoke is provided which bears against only one of the valve actuators so that one of the fluids can be dispensed without the other. Resilient return means is provided urging the actuators into the closed position and the seal is maintained by the pressure of the fluids in their respective fluid lines.

In addition, a mixing device is disclosed in order to provide the more viscous of the two fluids from adhering to the spout of the device.

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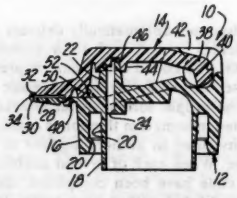
**3,651,992**

**TAMPER-PROOF CLOSURE**

**Robert E. Hazard, North Kingstown, R.I., assignor to Polytop Corporation, Slatersville, R.I.**

**Filed Mar. 23, 1970, Ser. No. 21,591**
**Int. Cl. B67b** *5/00;* **B67d** *5/32*
**U.S. Cl. 222—153** **7 Claims**



A tamper-proof closure is disclosed which includes an integrally formed top and lid. The top and the lid are initially

connected together by a severable member and by cooperating bearing and trunnion means in such a manner that the lid closes off a dispensing opening in the top. The severable member is capable of being broken so that thereafter the lid may be rotated with respect to the top between open and closed positions.

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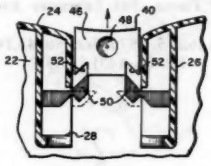
**3,651,993**

**AEROSOL DISPENSING CAP WITH TAMPER-RESISTANT ACTUATOR**

**Frank Venus, Jr., Watertown, Conn., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.**

**Filed Apr. 13, 1970, Ser. No. 27,672**
**Int. Cl. B65d** *83/14*
**U.S. Cl. 222—153** **7 Claims**




A one-piece molded plastic overcap and actuator assembly of inverted cuplike configuration is provided for a valved aerosol dispenser having an axially projecting valve stem at one end, wherein the actuator comprises an integrally hinged elongated tab partially cut from the bottom wall of the cup, the tab having a free-flexing end and a valve stem receiving socket adjacent that end at the underside, with an internal passage connecting the socket to a lateral discharge orifice in the tab. An integrally hinged pawl is formed on one of the overcap and actuator members, and a receiving notch for the pawl is let into the surface of the other to provide a ratchet which, when engaged, blocks movement of the actuator in the valve-operating direction. The pawl is normally biased by its hinge connection to nonengaging position relative to the notch and must be manually flexed into notch-engaging position.

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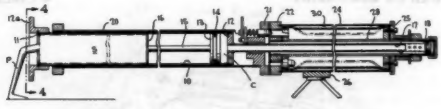
**3,651,994**

**CAULKING GUN**

**George F. Nordenholt, Dogwood Drive, MR 17 Morristown, N.J.**

**Filed Oct. 13, 1969, Ser. No. 865,897**
**Int. Cl. G01f** *11/06*
**U.S. Cl. 222—160** **9 Claims**



The sealant applicator hereinafter described in detail has been designed and constructed in such manner that, when operated to apply a ribbon or bead of sealant material to an article, piece of furniture or other work in which a sealed waterproof joint between or in structural members is required, the applied ribbon or bead is uniform in cross section throughout its entire length instead of varying in cross section as do the ribbons of sealant delivered by applicators of the types heretofore employed. To realize this objective a novel mechanism is employed, extrusion of sealant being effected at a rate which is strictly proportional to the linear progress of the spout which delivers the sealant carried in the sealant containing cartridge into the crack or joint to be sealed. Liquid under pressure, automatically metered, is utilized to effect the discharge of sealant.

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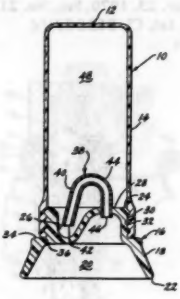
**3,651,995**

**SQUEEZE BOTTLE WITH HYDROSTATIC PASSAGE TO RESTRAIN LEAKAGE**

**Ray O. Chaney, R.R. #6, Wapakoneta, Ohio**

**Filed Aug. 25, 1969, Ser. No. 852,614**
**Int. Cl. B65d** *37/00*
**U.S. Cl. 222—211** **7 Claims**




No-drip squeeze bottle for catsup, mustard, etc., having an inverted generally U-shaped outlet tube.

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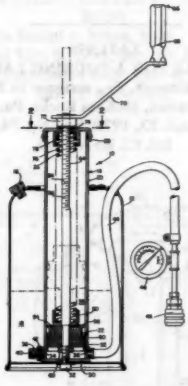
**3,651,996**

**APPARATUS FOR PRESSURIZING A FLUID SYSTEM**

**Frederick R. McFarland, and Walter L. Diffenderfer, both of Lancaster, Pa., assignors to K-D Manufacturing Company, Lancaster, Pa.**

**Filed Apr. 29, 1970, Ser. No. 32,865**
**Int. Cl. B67d** *5/42, 5/50*
**U.S. Cl. 222—385** **9 Claims**



An apparatus is provided for pressurizing a fluid system, for example, a hydraulic brake system of an automobile, which is comprised of a tank for holding a supply of fluid and a pump. The pump is connected to the tank through a pressure sensitive check valve. The pump has a piston which, when it is drawn upward, creates a vacuum inside the pump which causes the check valve to open and allows fluid from the tank to flow into the pump. When sufficient fluid is inside

the pump, pressure is then applied to the piston which pressurizes the fluid inside the pump and closes the check valve. The fluid inside the pump is now under pressure and in this condition can be introduced into various fluid systems for the purpose of pressurizing the systems. This apparatus is especially useful for bleeding of hydraulic brake systems.

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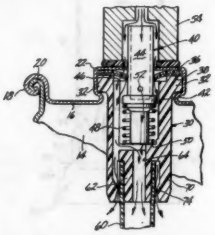
**3,651,997**

**COMBINED PRESSURE FILLING AND DISPENSING CONTROL VALVE FOR AEROSOL CONTAINERS**

**Frank Venus, Jr., Watertown, Conn., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.**

**Filed Mar. 23, 1970, Ser. No. 21,963**
**Int. Cl. B65d** *83/14*
**U.S. Cl. 222—402.16** **9 Claims**



A valve for an aerosol dispensing container which functions not only to control normal fluid dispensing from the container but also facilitates pressure filling where the valve is sealed in the mouth of the container prior to loading. The valve employs a tailpiece and plastic dip tubing mounted on the tailpiece, in conjunction with a coaxial integral sleeve on the valve housing, to form a resilient seal which is effective against fluid bypassing the dip tube at normal internal operating pressures of the aerosol dispenser, but which permits such bypassing to occur when filling pressures are introduced into the valve housing. Preferably the valve also incorporates special sealing grommets surrounding the neck of the valve stem which act as a one-way check valve providing increased flow rate of fluid product around the valve stem during pressure filling.

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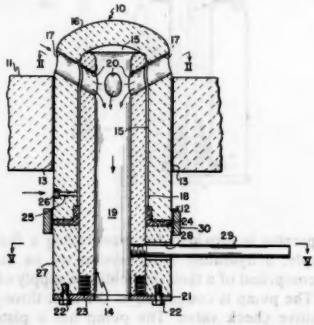
**3,651,998**

**NOZZLE FOR A POURING LADLE**

**George Rocher, Pittsburgh, Pa., assignor to Metallurgical Exoproducts Corporation, McKees Rocks, Pa.**

**Filed Sept. 23, 1970, Ser. No. 74,733**
**Int. Cl. B67c** *3/00*
**U.S. Cl. 222—488** **10 Claims**



A nozzle for insertion into the central opening of a nozzle seat in a pouring ladle has a stationary member and a rotatable member. The stationary member is secured within the central opening of the nozzle seat and has a closed upper surface, a central passageway and a plurality of spaced openings communicating with the central passageway. The rotatable member is positioned within the central passageway of the stationary member to define an annular gap therebetween. The rotatable member also has a plurality of spaced channels leading to a central aperture so upon rotation of the rotatable member, the openings of the stationary nozzle and the channels of the rotatable member are aligned to provide a continuous exit for liquid from the ladle. An inert gas is directed into the gap to prevent liquid metals from entering therein and also to lubricate the system.

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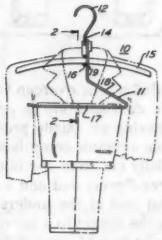
**3,651,999**

**GARMENT HANGER FOR SUITS**

**Emanuel Richard Fiocca, 745 Lancaster Avenue, Philadelphia, Pa.**

**Filed June 5, 1970, Ser. No. 43,749**
**Int. Cl. A47j** *51/08*
**U.S. Cl. 223—88** **3 Claims**



A garment hanger for suits which is of two piece construction with a main coat hanger and an auxiliary trousers hanger attachable and detachable to the hook of the coat hanger above the collar of the coat.

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**ERRATUM**

For Class 224—42 see:
Patent No. 3,652,009

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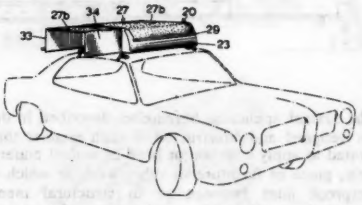
**3,652,000**

**COMBINED CAR-TOP CARRIERS AND SHELTERS**

**Neal K. Steinhoff, Pioneer Place, Route #1, Verona, Wis.**

**Filed Nov. 6, 1970, Ser. No. 87,488**
**Int. Cl. B60m** *11/00*
**U.S. Cl. 224—42.01** **4 Claims**



A car-top carrier having a housing of generally rectangular configuration providing a top-opening main storage compartment and a side-opening secondary compartment. A pair of opposing side doors, mounted on vertical hinges, close the second compartment and swing open to provide supports for a tarpaulin unrolled from a shelf in the secondary compart-

ment to form a protective shelter at one side of the automobile.

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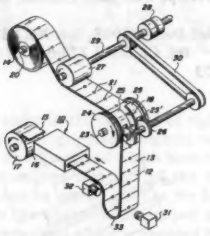
**3,652,001**
**LABEL STRIP FEEDER**

**Herbert C. Artelt, Jr., Wildwood, Ill., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Oct. 12, 1970, Ser. No. 79,971**
**Int. Cl. B65h *17/36***
**U.S. Cl. 226—65** **5 Claims**



A feeder for advancing a label strip in increments equal to one label width or multiple thereof to a knife mechanism where the strip is cut into individual labels. The feeder includes a reciprocal driver adapted on the forward stroke thereof to engage the label strip and advance the strip one increment, the strip having successive perforations for this purpose. A one-way brake to prevent movement of the strip on the return stroke of the drive is provided. The driver rides in a track which is both movable and tiltable to accommodate various strip materials and thicknesses. An adjustable cover spaced opposite the driver permits further adjustment for changed strip materials and thicknesses while enabling the driver during the feed stroke to arch the strip and discourage buckling of the strip.

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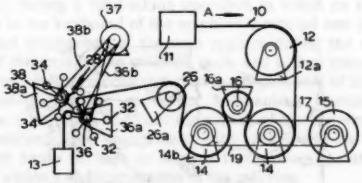
**3,652,002**
**TRACTION DEVICES**

**George Pollard Dennis, 6 Hilary Mansions, Malonie Road, Wallasey, England, assignor to Pen Croft Dyeing and Printing Co. Limited, Bury, Lancashire, England**

**Filed Oct. 15, 1970, Ser. No. 81,067**
**Claims priority, application Great Britain, Oct. 25, 1969, 52,380/69**
**Int. Cl. B65h *17/20***
**U.S. Cl. 226—172** **9 Claims**



The present invention provides traction apparatus for wet cloth comprising at least one, horizontally mounted, cylindrical traction roller whose peripheral surface is roughened or knurled for penetrating surface liquor and contacting wet cloth when the latter is fed at least partially around the roller, the peripheral surface of the traction roller being further provided with left and right handed helical grooves for carrying liquor deposited by the cloth on the traction roller towards the ends thereof, and a tensioning device arranged downstream of the traction roller in the direction of movement of cloth driven by the traction roller and adapted to provide an oscillating tension in cloth engaging the traction roller so as to enhance driving contact of the cloth with the traction roller.

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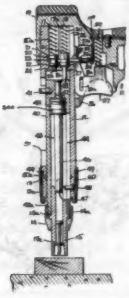
**3,652,003**
**POWDER ACTUATED TOOL**

**Ignazio Leonardo, Mountainside, and Harold C. Pfeiffer, Roselle Park, both of N.J., assignors to General Cable Corporation, New York, N.Y.**

**Filed Apr. 6, 1970, Ser. No. 26,022**
**Int. Cl. B25c *1/14***
**U.S. Cl. 227—10** **5 Claims**



A powder actuated tool including a barrel with a muzzle affixed to one end is disclosed. A cylinder is movable within the barrel and a piston having a piston rod extending through the muzzle is movable within the cylinder. Stop means are located in the cylinder and the guidepin is located on the barrel. Adjustable means are provided for varying the stroke length of the piston within the cylinder and means are provided for increasing the service life of the piston rod.

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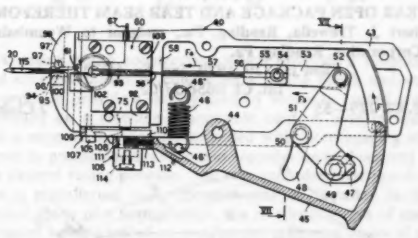
**3,652,004**
**DEVICE FOR FIXING LABELS TO A SUPPORTING BODY**

**Battista Lozio, Via Stefini 6, Milan, Italy**

**Filed May 5, 1970, Ser. No. 34,831**
**Claims priority, application Italy, Feb. 4, 1970, 20221 A/70**
**Int. Cl. B25c *1/00***
**U.S. Cl. 227—67** **4 Claims**



A device for fixing labels to a supporting body, such as for example a fabric, by means of connecting elements consisting of a button and an anchoring body connected by a thin filament. The device comprises a hollow needle with a longitudinal slot, a piston which thrusts said anchoring body forward along said slot of said needle, a kinematic mechanism which feeds said connecting elements, assembled to form a unit, in continuous succession in such a manner that the anchoring body of each element is each time brought into alignment

with said needle, and means for cutting each connecting element from said unit when the anchoring body of the element considered is thrust along the slot of said needle.

The kinematic mechanism which feeds the connecting elements in continuous succession is wholly contained in a piece house in a freely removable manner in the body of the device, and is not constrained with the other members of this latter.

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**3,652,005**

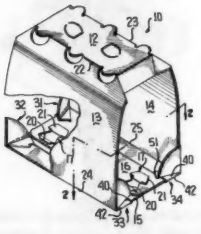
**CARTON WITH GUSSETTED ENDS**

**Nicholas V. Morgese, Garnerville, N.Y., assignor to Continental Can Company, Inc., New York, N.Y.**

**Filed May 15, 1970, Ser. No. 37,782**

**Int. Cl. B65d** *5/02*

**U.S. Cl. 229—40** **21 Claims**



This disclosure relates to a carton blank and a carton formed therefrom which includes top, side and bottom panels with the side panels each including an end panel joined thereto along a fold line whereupon being set up into a generally tubular configuration the end panels at least partially close axially opposite ends of the carton. The major feature of the invention is a locking panel associated with each bottom and end panel in the form of a pair of locking panel portions divided by a fold line which permits the locking panel to be folded or gussetted interiorly of the tubular body to maintain each end panel disposed less than 90° relative to its associated side panel whereby a projecting nose of one of the locking panel portions is deeply disposed within the carton at a position whereat the bottom wall of an associated container packaged within the carton may rest upon the nose to preclude inadvertent unfolding of the locking panel portions.

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**3,652,006**

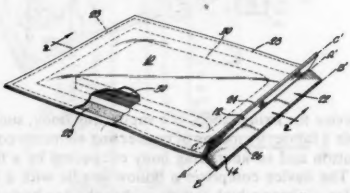
**TEAR OPEN PACKAGE AND TEAR SEAM THEREFOR**

**Robert J. Trewella, Reading, Pa., assignor to Wyomissing Corporation, Reading, Pa.**

**Filed Jan. 20, 1970, Ser. No. 4,330**

**Int. Cl. B65d** *33/02*

**U.S. Cl. 229—55** **2 Claims**



A tear-open package comprising a flexible packaging material, such as paper, sealed around its periphery but spaced apart near its center to provide a product-receiving cavity, the package having a pleat formed along one edge thereof to provide a pair of adjacent outwardly extending and readily graspable folds. The folds are reinforced by stiffening strips or by adhesive material, except along the fold line between folds, so that when the folds are grasped and pulled apart the package will tear open along the fold line between the reinforced folds.

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**3,652,007**

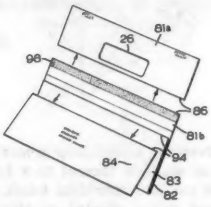
**TWO-WAY MAILING ENVELOPE**

**Bruce A. MacDougall, Clarkson, Ontario, Canada, assignor to Dominion Envelope Company Limited, Don Mills, Ontario, Canada**

**Filed Dec. 8, 1969, Ser. No. 882,889**

**Int. Cl. B65d** *27/06, 27/10*

**U.S. Cl. 229—73** **2 Claims**



A two-way mailing envelope and a continuous envelope assembly which consists of a plurality of collated two-way mailing envelopes. The two-way mailing envelope comprises a front wall panel and a back wall panel which are secured to one another to form a mailing pouch and a closure flap for closing the envelope. The front wall panel has a greater height than the back wall panel so as to provide a permanent record panel which projects beyond the upper edge of the back panel. The closure flap means includes flap means for closing the envelope for first mailing and flap means for closing the envelope for second mailing. The continuous assembly consists of a plurality of envelopes serially connected to one another with the permanent record panels thereof exposed in the same plane for printing purposes.

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**3,652,008**

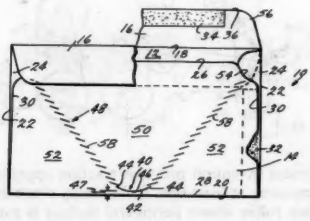
**ENVELOPE**

**William H. Grotefend, Bowie, Md., assignor to Computing & Software, Inc., Century City, Los Angeles, Calif.**

**Filed Nov. 27, 1970, Ser. No. 93,012**

**Int. Cl. B43m** *5/00, 7/00*

**U.S. Cl. 229—85** **18 Claims**



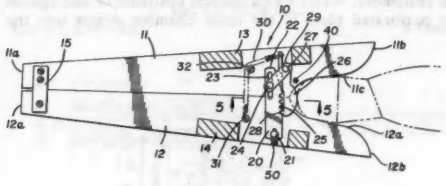
A side-seam envelope having, on its back panel, a tab defined by a tab die cut spaced a sort distance from the bottom edge of the back panel and a pair of tear lines extending upwardly from the free ends of the die cut to at least the free bottom edge of the flap in its secured position.

3,652,009

## ADJUSTABLE BOOT JACK

Ronald L. Foster, 3633 Hudson Drive, Stow, Ohio

Filed June 15, 1970, Ser. No. 46,015
Int. Cl. A47j 51/02
U.S. Cl. 223—116 7 Claims



A boot jack to assist in the removal of tight-fitting boots which includes opposed gripping members which are connected at one end by a hinge and which have their remaining ends contoured to engage the heel of the boot. The two gripping members can be spread apart as the heel of the boot is inserted between the contoured ends, and a spring-loaded control member is provided which is engaged by the heel and which locks the opposed gripping members in a spaced-apart condition conforming to the size of the particular boot involved. A second control means is also provided for fine adjustment.

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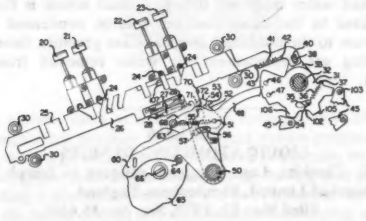
3,652,010

## TOTALIZER CONTROL MECHANISM

Hans-Juergen Krause, and Johannes Rindsfuesser, both of Berlin, Germany, assignors to The National Cash Register Company, Dayton, Ohio

Filed Nov. 9, 1970, Ser. No. 87,767
Int. Cl. G06c 21/00
U.S. Cl. 235—60 R 10 Claims



A device for controlling the totalizer mechanism of a cash register during a total-taking operation in which an amount set up in the keyboard of the machine is entered into the differential mechanism of the cash register during the second half of the total-taking machine cycle and is then transferred into the totalizer mechanism during the first half of the next succeeding machine operation. Mechanisms operated by various control keys control the timing of the movement of the totalizers into engagement with rack members in the amount banks of keys to allow a total-taking operation to occur within a single operation of the machine.

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3,652,011

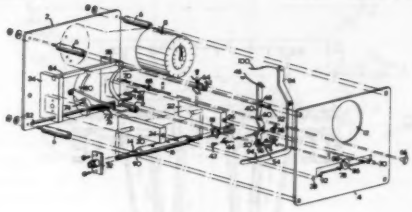
## ELAPSED TIME RECORDER

Glyn West, 30 Leopold Drive, Sarnia, Ontario, Canada

Filed Feb. 19, 1969, Ser. No. 800,443
Claims priority, application Canada, Mar. 1, 1968, 013,730
Int. Cl. G07c 1/00
U.S. Cl. 235—104 7 Claims

An instrument incorporates a stop clock which records the time that elapses between the start of turning of a shaft in a specified direction and the completion of a predetermined number of revolutions in that direction. The clock is started by a ratchet and pawl device so that movement in the reverse direction does not start the clock, and the predetermining counter which may be, for example, a friction member bearing on a screw thread has a starting point which can be locked, as desired to alter the predetermined number of revolutions. The stopping point is always the same so that the predetermining counter in effect counts down from an adjustable start.

The instrument is primarily intended for measuring the time for an automobile to cover a fixed distance from a standing start by a simple attachment to a road wheel. The ratchet and pawl feature allows the vehicle to be moved (e.g., for accurate positioning on a starting line) without resetting the timer by using the reverse gear.



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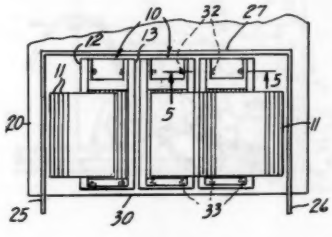
3,652,012

## VOTE RECORDING CONSTRUCTION

Joseph P. Harris, 1020 Lassen Street, Berkeley, Calif., and Leonard N. Albrecht, 1920 Paradise Drive, Tiburon, Calif.

Filed July 9, 1970, Ser. No. 53,506
Int. Cl. G07c 13/00
U.S. Cl. 235—50 4 Claims

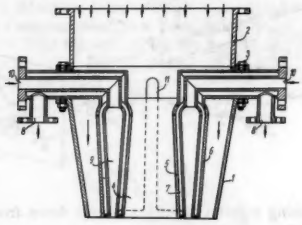


A voting booth construction which provides a simplified and efficient means of combining a voting booth and vote recorder to provide a facility used by voters to record votes manually on a machine processable card. A vote recorder and a support therefor are provided with interengaging elements to position and secure said recorder on said support in the desired voting position. The vote recorder is designed so that a plurality of said recorders may be installed in the limited space of a voting booth, the reference pages of each recorder being adapted to overlap the reference pages of an adjoining recorder. The interengaging elements on the vote recorder and its support are so arranged as to permit one or more recorders to be attached to the support in various predetermined positions to enhance the efficiency of the voting operation. The preferred form of the invention includes a plurality of projections on the vote recorder and a sufficient number of apertures on the support to permit installation of the vote recorder in different positions depending upon the requirements of the election and to provide for the convenience of voters.

## 3,652,013
## DEVICE FOR SPRAY DRYING OF LIQUIDS BY MEANS OF HOT GASEOUS MEDIUM

Mikhail Vasilievich Lykov, Simonousky val, 22 Korpus 2, kv. 53; Gleb Fedorovich Rybalchenko, ulitsa Gishina, 18, kv. 73, and Mikhail Alexeevich Korotkov, selo Semenoskoe, 139, all of Moscow, U.S.S.R.

Filed May 1, 1970, Ser. No. 33,736
Int. Cl. B05b 7/06
U.S. Cl. 239—132.3 3 Claims

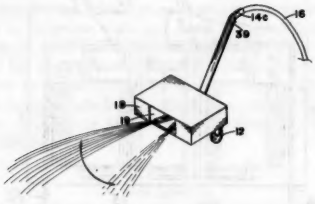


A device for spray drying of liquids by means of a hot gaseous medium fed to a convergent channel wherein there is a nozzle for a liquid being sprayed. Said nozzle is arranged in a channel formed by the double walls of a hollow body of rotation, said body being placed inside the convergent channel and coaxial with the latter.

## 3,652,014
## OSCILLATING SPRAY-CLEANING DEVICE

Thomas Leo Neville, 1590 Yates Street, Denver, Colo.

Filed Mar. 11, 1970, Ser. No. 18,537
Int. Cl. B05b 9/02
U.S. Cl. 239—287 9 Claims




A spray-cleaning device includes a movable platform supporting a swiveled holder adapted for positioning a spray nozzle in a generally horizontal and forwardly directed position. A mechanism is arranged to manually oscillate the swiveled holder from side to side through a limited arc of travel to spray a relatively wide strip of surface area forwardly of the device. A hollow handle is secured to the platform and the platform is mounted on wheels to facilitate manual movement thereof and the hollow handle passes liquid via a hose coupled to the nozzle.

## 3,652,015
## NEBULIZER

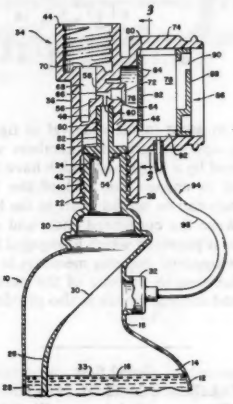
Glenn L. Beall, Gurnee, Ill., assignor to Respiratory Care, Inc., Northbrook, Ill.

Filed May 11, 1970, Ser. No. 36,340
Int. Cl. B05b 7/30
U.S. Cl. 239—338 7 Claims

A water supply is adapted as a source for nebulized liquid through the agency of an adapter which couples oxygen pressure to a container for the water. A venturi within the adapter draws from the water supply and directs atomized water and oxygen through an outlet pipe on the adapter.

A perforated plate is disposed in the path of flow downstream of the venturi and divides the outlet pipe into inner and outer chambers. It traps water particles which are too large to pass through the plate perforations and passes the remainder. Water which collects upstream of and against the perforated plate in the inner chamber drains into the outer chamber through lowermost perforations.

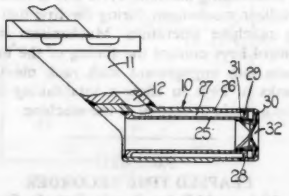
A baffle plate is disposed in the outlet end portion of the outlet pipe; and it intercepts water condensed in the outer chamber and has an arcuate upper opening for passage of nebulized water from the fitting. A duct which is fluidally connected to the outer chamber returns condensed water therefrom to the container and stabilizes pressure therein by providing gas replacement for water removed from the system.



## 3,652,016
## LIQUID ATOMIZING DEVICES

Alan G. Cheshire, Lane, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed May 12, 1970, Ser. No. 36,650
Int. Cl. B05b 7/06
U.S. Cl. 239—424.5 2 Claims



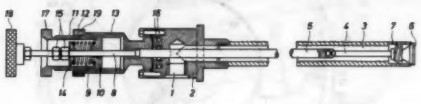

A liquid fuel atomizing device includes a tube through which air flows, a conical flow deflector at the downstream end of the tube, and nozzles for supplying fuel into the airstream adjacent the edge of the deflector.

3,652,017

## OIL ATOMIZATION BURNER

Aage Nielsen, Hellerup, Denmark, assignor to H. Nielsen & Sons Maskinfabrik A/S, Herlev, Denmark

Filed June 18, 1970, Ser. No. 47,534
Claims priority, application Denmark, June 24, 1969, 3386/69
Int. Cl. B05b *1/32*
U.S. Cl. 239—453 5 Claims



In certain oil burners the valve opens by an outward movement of the valve body against the action of an interior spring. This spring is now located outside the oil passage to facilitate adjustment when changing oil type.

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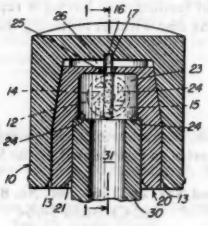
3,652,018

## PLUG AND CAVITY MECHANICAL BREAK-UP BUTTON

John Richard Focht, Yonkers, N.Y., assignor to Precision Valve Corporation, Yonkers, N.Y.

Filed June 12, 1970, Ser. No. 45,720
Int. Cl. B05b *1/34*
U.S. Cl. 239—490 7 Claims



An aerosol valve actuator button having a swirl chamber for mechanical breakup of the product stream proximate the spray discharge orifice is constructed in two pieces, an exterior body piece including a central cavity having wall portions including a depression forming the swirl chamber surrounding a discharge orifice, and an interior insert or plug adapted to be received in the cavity of the body piece, the insert piece including a valve stem receiving socket and product flow channels.

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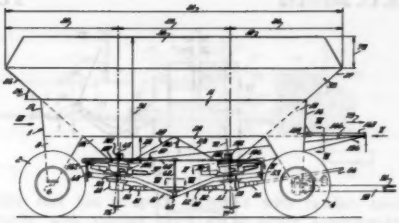
3,652,019

## DEVICES FOR DISTRIBUTING MATERIAL

Cornelis van der Lely, 7 Bruschenrain, Zug, Switzerland

Filed Feb. 16, 1970, Ser. No. 11,601
Claims priority, application Netherlands, Feb. 21, 1969, 6902712
Int. Cl. A01c *17/00*
U.S. Cl. 239—682 30 Claims

A spreader device having a hopper on a frame supported on front and rear ground wheels. One or more rotatable spreaders are mounted beneath a nozzle at the lower side of the hopper and between the ground wheels, when viewed from aside. When a plurality of rotatable spreaders are included, they can be located side-by-side or in spaced relationship along the longitudinal center line of the device. The spreaders can be turned in the same or different directions. The device can be hitched to a prime mover and steered by an axle connecting its front ground wheels. Each rotary spreader can be controlled by its dosing mechanism having a control member extending to the front of the device. A guide hood can be positioned above the rotary spreader and the



spreader supported on an adjustable portion of the frame. The hopper can be divided into several delivery funnels of different sizes.

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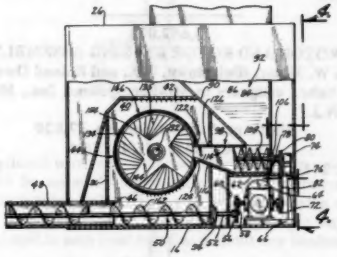
3,652,020

## FEED MILL

Harry A. Kopps, 110 South Street, and Howard E. Hull, 316 North Oak Street, both of Griggsville, Ill.

Filed Dec. 4, 1969, Ser. No. 882,006
Int. Cl. B02c *13/06, 23/02*; B65g *47/16*
U.S. Cl. 241—74 6 Claims

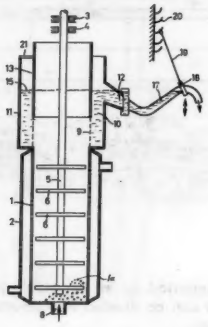


A feed mill comprising a housing having a feed grinding compartment provided therein with a grinding rotor rotatably mounted in the grinding compartment. A perforated screen extends around the rotor and has an inlet opening formed therein which is in communication with the discharge end of a conduit means. The inlet end of the conduit means is in communication with a hopper means which is in communication with a source of the feed to be ground. An auger means is provided in the conduit means and is adapted to convey the feed into the interior of the perforated screen so that it can be ground by the rotatable rotor therein. The rotor is comprised of a plurality of spaced apart grinding hammers which are staggered with respect to each other so as to provide a spiral configuration to the rotor. The rotating rotor means grinds the material and forces the same outwardly through the perforated screen into the grinding compartment. The ground feed is discharged from the grinding compartment by means of a discharge auger means extending therefrom.

## 3,652,021
## STIRRING MILL

Kaspar Engels, Mannheim, Germany, assignor to Firma Draiswerke GmbH, Mannheim-Waldhof, Germany

Filed Dec. 5, 1969, Ser. No. 882,430
Int. Cl. B02c *17/16*
U.S. Cl. 241—172 3 Claims

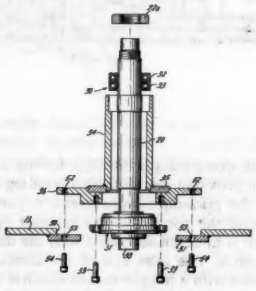


Stirring mill with a grinding container filled with milling pellets approximately 0.078 inch to 0.236 inch in size and equipped with a rapidly running stirring mechanism where a pump feeds in at one end the material to be ground and the ground material leaves the container at the other end by way of a separating arrangement that separates the grinding container from the discharge space and the milling pellets and the coarse components from the fine material, having a top portion connected with the grinding container that defines the discharge space and which has a material discharge duct the height and/or width of which is adjustable and a pressure head duct.

## 3,652,022
## ROTOR AND ROTOR BEARING ASSEMBLY

William W. Miner, Hightstown, N.J., and Roland Owens, Verdon, Nebr., assignors to Mil-Pac Systems, Inc., Mountainside, N.J.

Filed Apr. 9, 1970, Ser. No. 27,029
Int. Cl. B02c *13/14*, *13/26*
U.S. Cl. 241—185 8 Claims

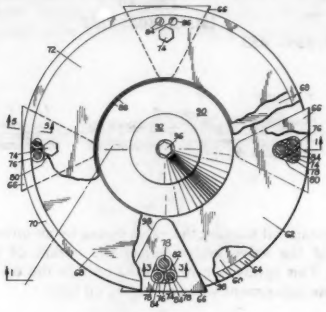


A reduction mill is provided with a removably mounted rotor and rotor bearing assembly which may be readily removed from the reduction mill for repairs and servicing. The rotor has attached thereto a plurality of radially extending hammer blades operative during rotation of the rotor to pulverize and reduce in size materials flowing through the reduction mill. The rotor is rotatably mounted by means of a pair of rotor bearings and the rotor and rotor bearings are detachably mounted as an integral unit to a subfloor of the reduction mill.

## 3,652,023
## IMPACT CRUSHER

Bruce V. Wood, 1601 N. E. Columbia Road, Portland, Oreg.

Filed Mar. 17, 1970, Ser. No. 20,347
Int. Cl. B02c *13/09*
U.S. Cl. 241—275 9 Claims

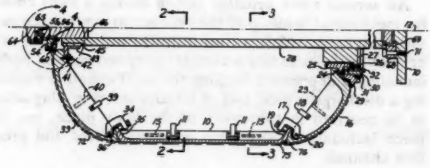


An impact crusher having impeller shoes which are triangular in shape for operation in either forward or reverse directions of rotation without shifting their positions. The shoes are maintained in place by attaching structure which holds the impeller shoes without applying a compressive clamping force thereon. The impeller shoes have dished impelling surfaces for improved efficiency. The crusher includes a central feeding disc having a replaceable ring portion to renew the disc without replacing the entire feeding assembly.

## 3,652,024
## MANDRELS

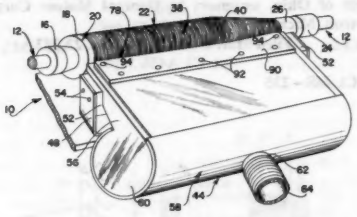
Harry A. Setnik, Sacramento, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Nov. 26, 1969, Ser. No. 870,572
Int. Cl. B65h *54/64*
U.S. Cl. 242—1 2 Claims



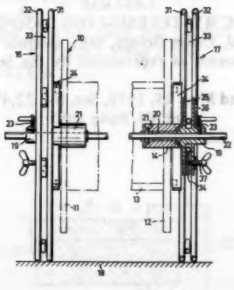
A mandrel assembly according to the present disclosure comprises a plurality of first mandrel segments adapted to form a substantially cylindrical body, a plurality of second mandrel segments adapted to form a portion of a first hemisphere, and a plurality of third mandrel segments adapted to form a portion of second hemisphere. Clamp means are provided to clamp the mandrel segments together to form the completed mandrel. A shaft is disposed through a center aperture in each of the hemispherical portions in such a manner that the mandrel segments forming the hemispherical portions at each end of the mandrel may be attached to the shaft. Fittings, to be integral with the completed container, are attached to the shaft and are adapted to support filament windings. At one end, the fitting is attached to the mechanism utilized to attach the mandrel segments to the shaft. At the opposite end, the fitting is attached to a support means which in turn is locked against a shoulder of the shaft by means of a threaded fastener.

3,652,025
**BOBBIN PROCESSING**
Frank C. DiMauro, Providence, R.I., assignor to Leesona Corporation, Warwick, R.I.
Filed Feb. 2, 1970, Ser. No. 7,760
Int. Cl. B65h *54/00*
U.S. Cl. 242—18 R 43 Claims



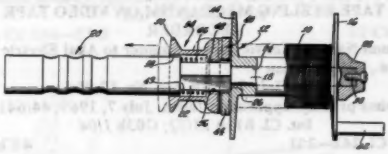
An apparatus and a method for handling the unwinding end of a wound body of yarn by releasing the end from adjacent winds of the yarn and, with the bobbin rotating, picking up and carrying the released end in a stream of air flowing into a suction nozzle. Lips of the suction nozzle automatically conform to the configuration of the body of yarn. One of the lips may engage the body to aid in releasing the end from the body and providing an air seal, and the other lip may be spaced from the body, thus providing more effective flow of the stream across the body to pick up the unwinding end. If desired, both lips may be spaced from the body of yarn. The unwinding end from the body of yarn, and a nozzle, as described above, if desired, may be provided for withdrawing the unwinding end.

3,652,026
**DEVICE FOR SUPPORTING AND TRANSPORTING A CABLE DRUM**
Folke Hildemar Awebro, V:a Malmgatan 9, 95 100 Lulea, Sweden
Filed Nov. 4, 1969, Ser. No. 874,006
Int. Cl. B65h *75/40*
U.S. Cl. 242—86.5 R 8 Claims



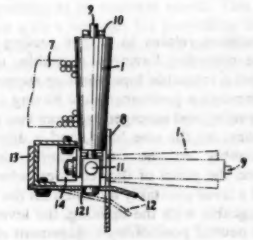
A cable drum is supported by bearing sleeves rotatably mounted on the hubs of two support wheels located at the ends of the drum and connected by a shaft. The drum is freely rotatable relative the ground and the support wheels. Each support wheel is composed of a first and a second substantially sector shaped section detachably secured to each other. When mounting the drum on the wheels, the two first sections are first mounted on the shaft through the drum when resting on the ground, whereafter the first sections are tilted together with the drum to a rolling position where the second sections may be mounted on the first sections.

3,652,027
**KITE REEL**
Yit-Chen Wong, 11618 Harvard Drive, Norwalk, Calif.
Filed Oct. 8, 1970, Ser. No. 79,062
Int. Cl. B65h *75/30*; A63h *27/08*
U.S. Cl. 242—96 3 Claims



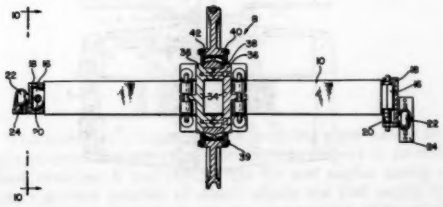
A kite reel has a spool provided with ratchet teeth cooperable with ratchet teeth of a collar nonrotatably mounted on a noncircular section located intermediate a handle portion of the reel and an axle extension of the handle.

3,652,028
**WIRE REEL FOR WELDING**
Jun Ukai, and Hisao Sugiyama, both of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed July 7, 1970, Ser. No. 52,922
Claims priority, application Japan, July 9, 1969, 44/54323
Int. Cl. B65h *49/00*
U.S. Cl. 242—129 6 Claims



The disclosed wire reel comprises side rollers on a supporting disc to be normally maintained in their operative position. Upon loading unloading a coil of welding wire on and from the reel, the rollers are turned through right angles to permit the coil to pass over the disc without any hindrance.

3,652,029
**LEVEL WIND FOR SPOOLING DRUM**
Faye H. Stewart, Eugene, Oreg., assignor to Bohemia Lumber Company, Incorporated, Eugene, Oreg.
Filed June 22, 1970, Ser. No. 48,263
Int. Cl. B65h *57/14*, *57/28*
U.S. Cl. 242—157.1 5 Claims



A level wind apparatus for use in cooperation with a spooling drum to wind the cable evenly across the drum core. The

level wind apparatus has a sheave mounted for axial movement along a bar of rectangular cross section while turning about its axis. The sheave has a plurality of supporting bearings in contact with the bar. The bar is eccentrically mounted in the manner standard for this type of apparatus.

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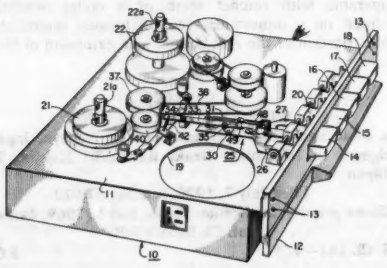
**3,652,030**

**TAPE REELING MECHANISM ON VIDEO TAPE RECORDER**

**Tatsumi Nakano, Tokyo, Japan, assignor to Akai Electric Co., Ltd., Tokyo, Japan**

**Filed July 7, 1970, Ser. No. 52,906**
**Claims priority, application Japan, July 7, 1969, 44/64185**
**Int. Cl. B11b *15/32*; G03b *1/04***
**U.S. Cl. 242—201** **4 Claims**



The invention relates to a tape reeling mechanism of a video tape recorder, having a rotatable, tape delivery reel support and a rotatable tape wind-up support. The improvements comprises a positioner slide having a substantially triangular opening and arranged between two operation control push buttons, on the one hand, and a drive wheel and idle roller assembly on the other hand, which is pivotably mounted on the panel of the recorder between the reel supports, and a lever pivotably mounted on the panel and having a pin engageable with the opening, the lever being positively held in its neutral position by engagement of the pin with the central apex of the triangular opening.

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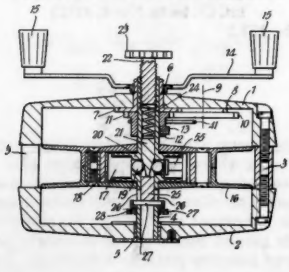
**3,652,031**

**FISHING REEL**

**Joseph Kosek, 11, Elgin Crescent, Caterham, Surrey, England**

**Filed Oct. 20, 1967, Ser. No. 676,831**
**Claims priority, application Great Britain, Oct. 25, 1966, 47,772/66**
**Int. Cl. A01k *89/02***
**U.S. Cl. 242—219** **15 Claims**



A fishing reel of the rotatable line-spool type having a resiliently engaged line brake clutch which is manually releasable to provide casting by overcoming the resilient engaging means and freeing the spool for rotation. The reel includes a silent one-way winding mechanism, a line over-run brake and an automatically releasable bite alarm mechanism.

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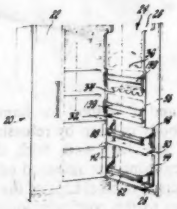
**3,652,032**

**SHELF BRACKET**

**Peter S. Eros, Vandalia, and Jerry L. Neubauer, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.**

**Filed Mar. 24, 1970, Ser. No. 22,332**
**Int. Cl. A45b *57/04***
**U.S. Cl. 248—235** **1 Claim**



In the preferred form, a refrigerator is provided with a door having an inner door pan of sheet plastic provided with rectangular apertures and horizontal shelves. Each of the shelves is provided with a removable metal shelf front, the ends of which are fastened to brackets of resilient nylon having oppositely facing notches adapted to engage the opposite sides of the rectangular apertures in the inner door pan. Between the oppositely facing notches is provided a resilient U-shaped portion having an extension from one of the notches provided with a knurled surface which can be pressed to disengage the brackets from the door or to insert the inner portion of the bracket into the recess into engagement with the notches for attaching the brackets to the door.

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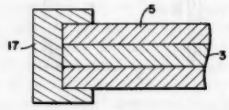
**3,652,033**

**MAGNETIC HYSTERESIS-LOSS DAMPING RODS**

**Theodore Wyatt, Union Bridge, Md., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed Mar. 25, 1970, Ser. No. 22,471**
**Int. Cl. B64g *1/00***
**U.S. Cl. 244—1 SA** **4 Claims**



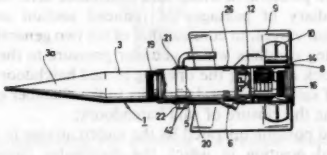
An improved damping rod structure, for dissipating undesired satellite motion by magnetic hysteresis and shorted coil damping, which provides increased damping capability for a given weight of magnetically permeable material. In one embodiment, a damping rod comprises an outer sleeve of electrically conductive material, an intermediate sleeve of magnetically permeable material, and an inner rod or sleeve of electrically conductive material, the structure acting both as a shorted coil and as a rigid support for the intermediate sleeve.

3,652,034

## MISSLE CONSTRUCTION

Werner Schindler, Ottobrunn; Karl Schauff, Hohenschaftlarn, and Erich Planitzer, Neubiberg, all of Germany, assignors to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed Sept. 17, 1969, Ser. No. 858,602
Claims priority, application Germany, Oct. 3, 1968, P 18 00 766.6
Int. Cl. F41g 7/02
U.S. Cl. 244—3.1 2 Claims



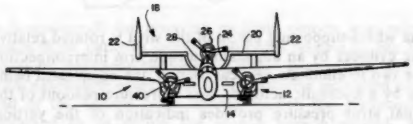
A missile or flying body construction includes a payload cone which is detachably connected to a fuselage portion by a coupling member. The payload cone forms the forward part of the missile and a rocket engine designed as an independent structural unit is made so that it can be inserted into the fuselage portion and secured thereto by means of an encircling clamping ring. The forward end of the rocket engine portion is provided with a threaded bore to permit interengagement thereof with a coupling member which is also threaded to the payload cone. The rocket engine carries a laterally or downwardly extending thrust nozzle projection which advantageously fits into a longitudinally elongated slot of the trailing fuselage portion. The fuselage portion in the form of a sleeve carries aerodynamic control surfaces and it forms a housing for controls such as a gyroscope, battery, and wire coil.

3,652,035

## CHANNEL TAIL AIRCRAFT

Charles G. Fredericks, 1411 Pennsylvania Avenue, N.W., Silver Spring, Md.

Filed June 12, 1969, Ser. No. 832,768
Int. Cl. B64d 27/00
U.S. Cl. 244—12 CW 6 Claims



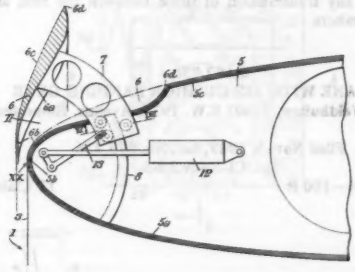
A twin boom lifting body fuselage aircraft has a twin tail assembly with a single horizontal stabilizer. A downward semicircular channel is formed in the center of the horizontal stabilizer, and an engine is mounted in the channel, with a propeller immediately adjacent a forward edge of the channel. The propeller draws air from the upper surface of the lifting fuselage and pushes the air rapidly through the channel, thereby increasing lift of the fuselage and of the horizontal stabilizer.

3,652,036

## DYNAMIC FORCED AIR INTAKES FOR VEHICLES

Claude M. Sans, Massy; Jacky R. Leynaert, Igny, and Georges D. Meauze, Paris, all of France, assignors to The Office Nationale d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.), Chatillon-Sous-Bagneux, France

Filed Oct. 21, 1969, Ser. No. 868,087
Claims priority, application France, Oct. 24, 1968, 171181
Int. Cl. B64d 33/02
U.S. Cl. 244—53 B 11 Claims



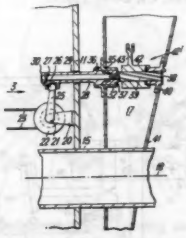
The forced air intake for vehicles and more particularly for high-speed subsonic aircraft comprises a frontal opening bounded by a profile the shape of which is determined as a function of the laws of aerodynamics brought into play when the vehicle is travelling at its nominal speed. This air intake usually cooperates with a turbojet for propelling the vehicle. The air intake comprises a plurality of movable flaps arranged over the outer surface of the profile, adjacent its leading edge. In their retracted position, the movable flaps restore the contour of the profile. In their extended position, the movable flaps define an intake horn for the air intake and a succession of convergent passages between their inner surfaces and the outer surface of the profile.

3,652,037

## AIRCRAFT

Geoffrey Dolby, Derby, England, assignor to Rolls-Royce Limited, Derby, England

Filed Nov. 10, 1970, Ser. No. 88,347
Claims priority, application Great Britain, Nov. 28, 1969, 58,394/69
Int. Cl. B64d 27/00
U.S. Cl. 244—56 4 Claims



This invention concerns aircraft including a gas turbine engine mounted for pivotal movement with respect to aircraft fixed structure, a fuel control unit for said engine having a rotary portion rotation of which adjusts the fuel supply to said engine, a control mechanism for rotating said rotary member, said mechanism being spaced from the pivot axis of the said engine, the said mechanism comprising a manually

adjustable member, a first member mounted within said fixed structure and displaceable in response to actuation of said manually adjustable member, a coupling device which is connected between said first member and said rotary member and which converts a relatively small linear movement into a relatively large rotational movement, and a second member secured to said device for interengagement with said first member, the first member when the said manually adjustable member is actuated, driving the second member and thus the said device to effect a relatively small linear movement and thus a relatively large rotational movement of said rotary member, pivotal movement of said engine being unaccompanied by any transmission of drive between the first and second members.

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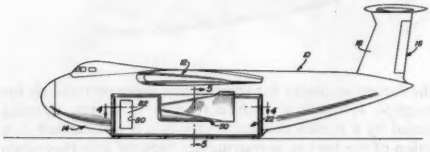
**3,652,038**

## AIRPLANE WITH AIR CUSHION LANDING GEAR

**John Van Veldhuizen, 31601 S.W. 197th Avenue, Homestead, Fla.**

**Filed Nov. 3, 1969, Ser. No. 873,436**
**Int. Cl. B60v** *3/08*
**U.S. Cl. 244—100 R** **11 Claims**



An aircraft fuselage defining a downwardly opening centrally disposed air cushion containing chamber bound along its opposite sides by upstanding longitudinally extending plenum chambers. Opposite side high bypass turbo engine pods are supported outwardly of the plenum chambers and structure is provided for variably bleeding the bypass air from the engine pods directly into the plenum chambers which in turn include lower outlets spaced longitudinally therealong opening at least substantially directly into the air cushion containing chamber.

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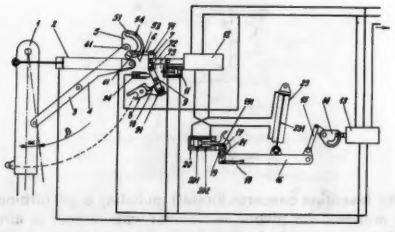
**3,652,039**

## CONTROL DEVICES FOR LANDING GEAR AND HATCHDOORS WITH MECHANICAL-HYDRAULIC SEQUENCES

**Rene Lucien, 56 Boulevard Maillot, Neuilly-sur-Seine, France**

**Filed Jan. 30, 1970, Ser. No. 12,526**
**Claims priority, application France, Jan. 31, 1969, 6902189**
**Int. Cl. B64c** *25/16*
**U.S. Cl. 244—102 A** **3 Claims**



A control device for the retractable undercarriage of aircraft and for the hatchdoors of the housing of the retracted undercarriage with their actuating and locking members and control members for supplying them in mechano-hydraulic sequential stages from a general lifting conduit and a general lowering conduit for the undercarriage, comprising a jack actuating said hatchdoors, a slide valve distributor supplying said jack, and a kinematic coupling mechanically operated by the undercarriage and placing said slide valve in three characteristic positions:

—a first position operated by the undercarriage in its locked down position, in which said distributor connects the general lowering conduit to the chamber of said jack actuating the closure of said hatchdoors, and the general lifting conduit to the chamber of said jack actuating the opening of said hatchdoors;

—a second position operated by the undercarriage in the unlocked position, in which said distributor acts, through the intermediary of passages of reduced section and spring controlled valves, to connect that of the two general lowering and lifting conduits which is under pressure to the chamber of the jack actuating the opening of said hatchdoors, and the other of said two general conduits to the chamber of the jack actuating the closure of said hatchdoors;

—a third position operated by the undercarriage in its locked retracted position in which the distributor connects said general lifting conduit to the chambers of said jack actuating the closure of said hatchdoors, and said general lowering conduit to the chamber of said jack actuating the opening of said hatchdoors.

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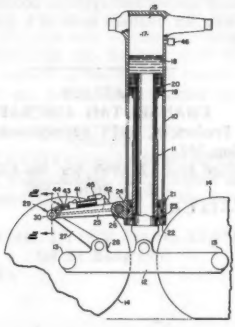
**3,652,040**

## LANDING GEAR SHOCK STRUT

**Erwin H. Hartel, Brunswick, Ohio, assignor to The Cleveland Pneumatic Tool Company, Cleveland, Ohio**

**Continuation of application Ser. No. 729,954, May 17, 1968, now abandoned. This application June 10, 1970, Ser. No. 48,833**
**Int. Cl. B64c** *25/58*
**U.S. Cl. 244—104 R** **9 Claims**



The wheel-supporting piston of the strut is rotated relative to the cylinder by an adjustable torque arm interconnection of the two to eliminate vertical friction, the adjustment being made by a hydraulic actuator, and a pressure readout of the internal strut pressure provides indication of the vertical weight load on the gear after such friction elimination.

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**3,652,041**

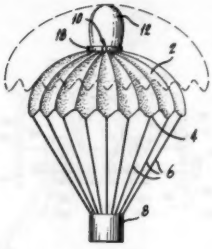
## REEFING DEVICE

**Edwin D. Vickery, Tolland, Conn., assignor to Pioneer Parachute Company, Inc., Manchester, Conn.**

**Filed Oct. 19, 1970, Ser. No. 81,938**
**Int. Cl. B64d** *17/34, 17/36*
**U.S. Cl. 244—152** **5 Claims**

A reefing device for parachutes is provided with means for confining a parachute, or a portion thereof, together with

control means operable in response to a combination of factors, namely the amount and duration of the forces applied to




the confining means, for effecting the release thereof. The reefing device is therefore operable under widely varying conditions of loading and speed of travel of the parachute.

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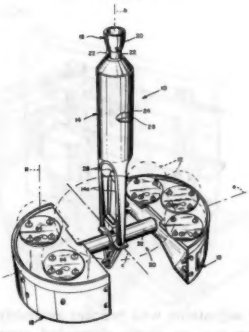
**3,652,042**

## SPACECRAFT FOR DEPLOYING MULTIPLE OBJECTS

**Robert S. Welther, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.**

**Filed Dec. 28, 1970, Ser. No. 101,521**
**Int. Cl. B64g *1/10***
**U.S. Cl. 244—1 SS** **13 Claims**



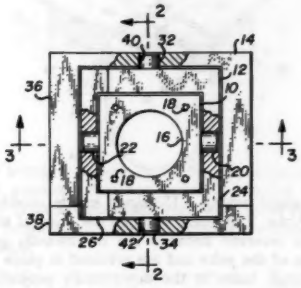
A spacecraft for inserting multiple objects into selected space flight paths in selected attitudes relative to the flight paths by deploying the objects, either passively or actively, from extendable object mounting platforms gimballed on one end of the vehicle body. During launch the platforms are retracted to fit within the launch vehicle shroud. After separation of the spacecraft from the booster in space, the platforms are extended to object deployment positions and the spacecraft is oriented by thrusters in a flight attitude wherein the thrust vector of a main propulsion engine on the vehicle body is aligned with the local range insensitive axis. Object deployment is accomplished by utilizing the main engine to propel the spacecraft along the range insensitive axis across the selected flight paths and by tilting the mounting platforms at each deployment point to orient the object to be deployed in the proper deployment attitude relative to the selected flight path.

**3,652,043**

## LEAD SCREW COUPLING

**Derek Jones, Campbell, Calif., and Woodrow L. Hayes, Rye, N.H., assignors to Singer-General Precison, Inc., Binghampton, N.Y.**

**Filed Dec. 31, 1969, Ser. No. 889,585**
**Int. Cl. A47g *29/00***
**U.S. Cl. 248—1** **1 Claim**




The disclosed embodiment of the present invention is a coupling for a lead screw and the like having four degrees of freedom and two degrees of constraint. The coupling is generally formed of three rectangular member, two of which have a central rectangular aperture for receiving another one of the members therein. The innermost member is pivotally supported within the central aperture of the intermediate member on one axis, and the intermediate member is pivotally supported within the central aperture of the outermost member on a second axis perpendicular to the first axis. The inner and outer peripheral surfaces of the members in assembled form are slightly spaced from one another to permit limited pivotal movement of the inner and intermediate members about their respective axes and to permit limited axial movement of the inner and intermediate members along their respective axes with respect to the outer member.

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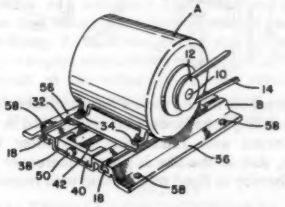
**3,652,044**

## ADJUSTABLE MOTOR MOUNT

**Delbert Manross, Willoughby, Ohio, assignor to The Lincoln Electric Company, Cleveland, Ohio**

**Filed Dec. 27, 1969, Ser. No. 869,775**
**Int. Cl. F16m *11/04***
**U.S. Cl. 248—23** **8 Claims**

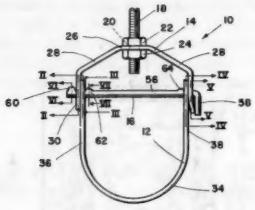



A mount for adjustably positioning an apparatus comprising a unitary, elongated base member having a supporting surface. The base member is a short section of an aluminum extrusion so that it has a generally uniform transverse cross-sectional shape throughout its longitudinal extent and has a pair of longitudinal slots in the supporting surface coextensive with the base member into which bolts extend for holding the apparatus in any adjusted position. A screw is provided for displacing the apparatus along the base member.

### 3,652,045
### PIPE HANGER

Andrew J. Hirt, Youngstown, Ohio, assignor to Hanger Supply Company, Youngstown, Ohio

Filed Mar. 13, 1970, Ser. No. 19,415
Int. Cl. F16l 3/00
U.S. Cl. 248—62 13 Claims

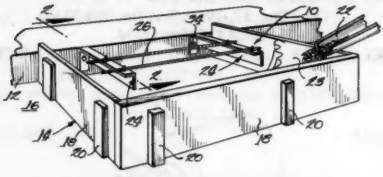


A pipe hanger having a U-shaped saddle member and a supporting yoke. The upper ends of the arms of the saddle member are received between the downwardly projecting end portions of the yoke and are retained in place by a rod passing through holes in the downwardly projecting yoke ends and in the upper ends of the arms of the saddle. One end of the rod is bent at right angles to provide a handle for turning the rod. The holes in the yoke and saddle are provided with notches and the rod has raised portions aligned on one side which pass through the notches when the rod is aligned in one direction and which are retained by the holes when the rod is rotated out of alignment. The raised portion of the rod furthest from the bent end is longer than the other raised portions and the notch of the hole in the saddle adjacent the bent end of the rod is smaller than the other notches so that the last mentioned raised portion does not pass therethrough. Raised portions are provided on the rod for keeping the upper ends of the saddle from moving inwardly under load.

### 3,652,046
### STEP BRACKET

William G. Hughes, 3200 West 185th Place, Homewood, Ill.

Filed Feb. 11, 1970, Ser. No. 10,362
Int. Cl. E04g 17/00
U.S. Cl. 248—205 R 8 Claims



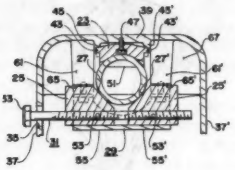
Supporting brackets having means for attachment to upper portions of a building foundation wall are secured in position and interconnected with reinforcing rods after which a concrete stoop, slab or the like is poured thereover so as to be supported thereby in fixed relationship with respect to the foundation.

### 3,652,047
### LUMINAIRE ATTACHING MEANS

George N. Starr, Memphis, Tenn., assignor to American Electric Manufacturing Corporation, Southaven, Miss.

Filed Aug. 18, 1969, Ser. No. 850,853
Int. Cl. F21v 21/10
U.S. Cl. 248—230 1 Claim

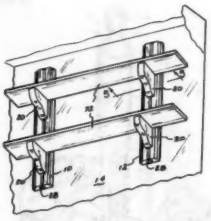
Luminaire mounting or attaching structure adapted for cantilever attaching a street lighting luminaire to the support arm structure of the luminaire supporting mast or pole structure. The luminaire attaching structure includes means for trilaterally clamping the distal end portion of the luminaire support arm including the anvil jaw and a pair of wedge jaws. A single bolt-like shaft having left-hand and right-hand thread portions is adapted to be turnably manipulated for causing converging or diverging movement of the pair of wedge jaw members respectively for causing trilateral clamping or loosening action of the anvil and wedge jaw members on the distal end of the luminaire support arm.



### 3,652,048
### VERTICALLY ADJUSTABLE WALL BRACKET ASSEMBLY FOR MOUNTING A SHELF

Lawrence Hartman, Royal Oak, Mich., assignor to Hartman Wood Products Inc., Royal Oak, Mich.

Filed Aug. 6, 1970, Ser. No. 61,547
Int. Cl. A47g 29/02
U.S. Cl. 248—243 6 Claims



A vertically adjustable wall bracket assembly for mounting a shelf having two or more elongated support members adapted to be mounted vertically on a wall, each support member having a vertically disposed T-shaped channel with an anchor plate slidably disposed therein, means on the anchor plate to secure the anchor plate inside the T-shaped channel at any vertical height, and means to attach the anchor plate to a shelf supporting bracket, the shelf supporting bracket being arranged for use as a support for a shelf.

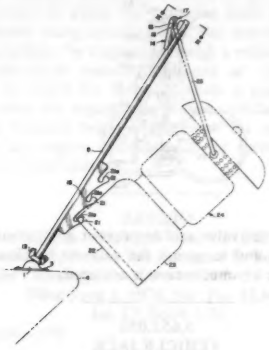
### 3,652,049
### LANTERN HOLDER

Claude A. McCown, 3619 Oakwood Drive, Grapevine, Tex.

Filed Aug. 27, 1970, Ser. No. 67,495
Int. Cl. B63b 45/04
U.S. Cl. 248—310 10 Claims

A lantern holder and mount which may be detachably mounted on a boat or other supporting surface wherein the upright hanger member on which the lantern is suspended may be disengaged from the base portion and stored when not in use. The suspending portion has an upper hanger

bracket engageable with the bail of the lantern and a lower engaging portion with a plurality of vertically spaced hangers thereon engageable with the lower rim of the lantern tank.



The lower end of the upright support has a head thereon engageable in a J-slot in the base member in angular non-rotative engagement with the base.

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**3,652,050**

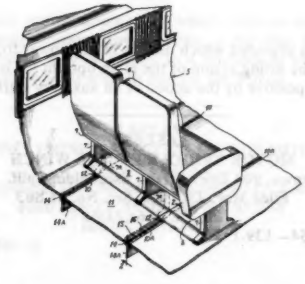
**VEHICLE SEAT MOUNTING SYSTEM**

**Ralph G. Marrujo, Valencia, and Aki Tanaka, Northridge, both of Calif., assignors to Fairchild Industries, Inc., Bay Shore, Long Island, N.Y.**

**Filed Feb. 5, 1970, Ser. No. 8,852**

**Int. Cl. B60n *1/00***

**U.S. Cl. 248—429** **9 Claims**



A vehicle seat mounting arrangement for mounting seat sets in vehicles equipped with fixed seat locking tracks. The seat legs are located without regard to the locations of the vehicle tracks and are fastened to a floor panel to provide equalized underseat storage room and unobstructed leg space. The floor panel is provided with movable locking mechanisms which can be aligned with the vehicle seat locking track and secure the seat assembly to the track.

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**3,652,051**

**FOLDABLE LAP DESK**

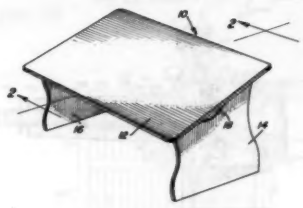
**Earl J. McFarlane, P.O. Box 653, Wilson, N.C.**

**Filed Mar. 25, 1970, Ser. No. 22,449**

**Int. Cl. A47b *97/08***

**U.S. Cl. 248—444** **3 Claims**

A horizontally elongated substantially planar top panel and a pair of upstanding support panels extending transversely of the opposite end portions of the top panel, dependingly supported therethrough and spaced inwardly from the opposite end edges of the top panel. The upper marginal edge portions of the support panels are hingedly supported from the top



panel for swinging movement of the support panels between extended positions disposed generally normal to the top panel and collapsed positions with the support panels swung inwardly beneath and closely underlying the undersurface of the top panel.

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**3,652,052**

**DEVICE FOR MANUFACTURING A PREFABRICATED BUILDING SECTION**

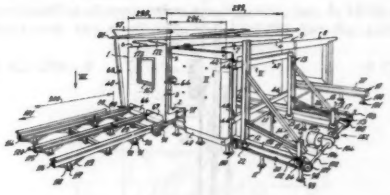
**Cornelis Van Der Lely, 7 Bruschenrain, Zug, Switzerland**

**Filed Dec. 5, 1969, Ser. No. 882,647**

**Claims priority, application Netherlands, Dec. 10, 1968, 6817718/68**

**Int. Cl. E04g *11/02***

**U.S. Cl. 249—27** **36 Claims**



A device for the manufacture of a prefabricated element intended to form at least part of a building. The device comprising at least two relatively movable jigs, which can be relatively fixed so that a mold can be formed in which a building element can be made to include at least two walls at an angle to each other, or a wall and a floor and/or an upper side of a section so that the element bounds at least part of the space of the building. At least one of the jigs is displaceable as a whole and coupled with driving members that displace the jig with respect to the other jig in two relatively opposite directions so that the parts can be moved away from each other or for moving the jigs in their relative manufacturing positions.

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**3,652,053**

**UNI-DIRECTIONALLY OPERATED VALVE APPARATUS**

**Edward J. Poitras, Holliston, and Edwin W. Wlodyka, Ashland, both of Mass., assignors to Highland Laboratories, Ashland, Mass.**

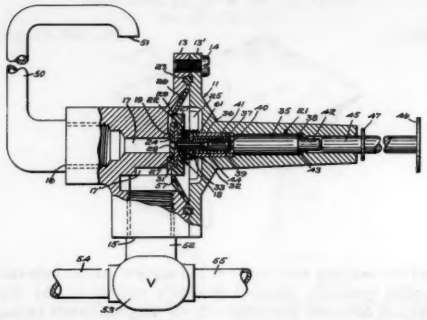
**Filed Feb. 9, 1970, Ser. No. 9,596**

**Int. Cl. F16k *31/385***

**U.S. Cl. 251—38** **7 Claims**

Disclosed is a valve that alternately prevents and allows fluid flow in response to sequential uni-directional movements of a reciprocal valve operator. Alternate inward movements of the valve operator induce seating and unseating

relative movements between a valve head and a valve seat to open and close a passage between inlet and outlet openings.



A spring member returns the operator to an outward neutral position after a pair of sequential inward control movements.

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**3,652,054**

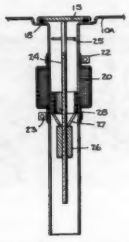
**MAGNETIC DRAIN VALVES**

**Howard M. Layton, Ossining, N.Y., assignor to Interlab, Inc., Pleasantville, N.Y.**

**Filed June 19, 1970, Ser. No. 47,744**

**Int. Cl. F16k** *31/06*

**U.S. Cl. 251—65** **7 Claims**



A magnetic drain valve for use in conjunction with process vessels having a nonmagnetic drain line. The valve includes a tubular armature core coaxially disposed within the drain line and coupled by a stem to a drain closure cap which normally blocks the drain line. The cap is located at the bottom of the vessel, so that, when lifted, liquid from the vessel is admitted into the drain line. Surrounding the drain line is a solenoid which, when energized, produces an electromagnetic field causing the core to move upwardly, thereby raising the closure cap.

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**3,652,055**

**VALVE CONSTRUCTION**

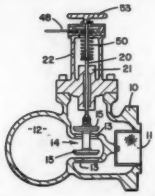
**Paul W. Scholz, Jeannette, and Charles C. Czuszak, Greensburg, both of Pa., assignors to Carrier Corporation, Syracuse, N.Y.**

**Filed Nov. 24, 1970, Ser. No. 92,393**

**Int. Cl. F16k** *31/44*

**U.S. Cl. 251—67** **5 Claims**

In a type of combined throttle and trip valve structure, the valve stem has threaded engagement with half nuts; the valve is opened by manual rotation of the stem. Operation of the trip mechanism effects lateral movement of the half nuts out of engagement with the stem and the valve is moved into closed position by spring means. The invention has to do with mechanism to automatically limit the extent of movement of



the valve from the valve seat to prevent any jamming of the valve assembly, and to permit the valve to be closed by the spring when the trip mechanism is actuated.

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**3,652,056**

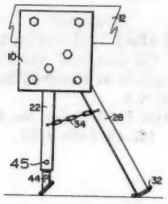
**VEHICLE JACK**

**Hansford D. King, 5754 Via Margarita, Santa Maria, Calif.**

**Filed Nov. 27, 1970, Ser. No. 93,040**

**Int. Cl. B66f** *7/22*

**U.S. Cl. 254—94** **8 Claims**



A jack is provided which derives lifting power from vehicle motion. The lifting action of the main upright leg is regulated and made positive by the action of an auxiliary starting leg.

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**3,652,057**

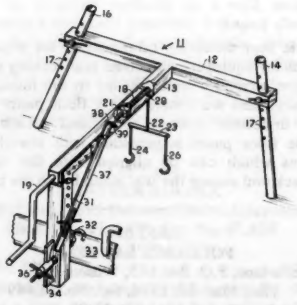
**MOTOR VEHICLE ENGINE WINCH**

**Jack H. Brown, 904 Erica Street, Escondido, Calif.**

**Filed Mar. 23, 1970, Ser. No. 21,803**

**Int. Cl. B66c** *23/60*

**U.S. Cl. 254—139.1** **2 Claims**



A motor vehicle engine winch having a hollow T-shaped structural member being supported at each end at the top of

the T-shaped structural member by a pair of adjustable legs and having a threaded shaft slidably received by another member's end carrying a captured nut therein; a tension cable attached to the captured nut passing downwardly through a bottom wall of the member of the T-shaped structural member in which the threaded shaft is received; the tension cable being attached to a bar suspending a pair of hooks therefrom for engagement with a vehicle motor; an L-shaped structural member attached at one end to the member in which the threaded shaft is passed carrying a hook member for engagement with a vehicle's rear bumper; the hook member being dimensioned for compressing and removing an engine compartment lid spring via a clamp member attached thereto.

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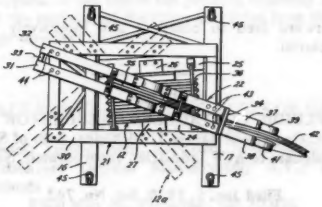
**3,652,058**

## THREE-POSITION CROWN BLOCK

**Albert A. Ashton, Dallas, Tex., assignor to Youngstown Sheet and Tube Company, Youngstown, Ohio**

**Filed June 2, 1970, Ser. No. 42,669**
**Int. Cl. B66d** *1/36*
**U.S. Cl. 254—190** **6 Claims**



A derrick crown assembly in which without rethreading the fast line, rotating crown blocks or the like, the crown block assembly may be shifted to a multiplicity of positions to drill multiple wells without moving the derrick.

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**3,652,059**

## TIRE PUNCTURING DEVICE TO IMPEDE MOVEMENT OF A VEHICLE

**Earl E. Groblebe, 1600 Sable Boulevard, #142, Aurora, Colo.**

**Filed July 17, 1970, Ser. No. 55,688**
**Int. Cl. E01f** *13/00*
**U.S. Cl. 256—1** **3 Claims**

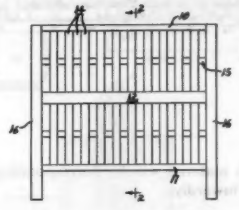
A plurality of hollow, sharpened, nail-like members are releasably secured in spaced relation along the length and width of an elongated strip to be extended across a roadway to puncture one or more pneumatic tires of a vehicle to provide controlled deflation of the tires and to impede the movement of the vehicle to assist law enforcement officials in the capture of the vehicle and occupants with a minimum of personal risk.

**3,652,060**

## FENCE

**Clinton G. Glover, Clarkston, Wash., assignor to Potlatch Forests, Inc., San Francisco, Calif.**

**Filed Aug. 3, 1970, Ser. No. 60,663**
**Int. Cl. E04h** *17/14*
**U.S. Cl. 256—19** **5 Claims**



A wood fence of "basket weave" design including parallel rails having oppositely facing grooves and perpendicular slats held in a weave pattern by an intermediate weaver board. The slats are fabricated from veneer stock and are permanently fixed with the rail grooves. The method of fence panel fabrication includes the step of bonding the slats in the grooved rails to form a permanent structural panel.

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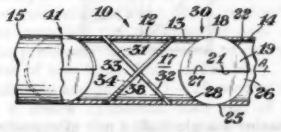
**3,652,061**

## INTERFACIAL SURFACE GENERATOR AND METHOD OF PREPARATION THEREOF

**Douglas S. Chisholm, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Continuation of application Ser. No. 583, Jan. 5, 1970, now abandoned. This application Mar. 4, 1971, Ser. No. 120,873**
**Int. Cl. B01f** *15/02*
**U.S. Cl. 259—4** **9 Claims**



A static element mixing tube is provided by employing opposed angularly disposed baffles of alternating hand which provides mixing action by re-positioning of the stream. Mixing action at flow rates below the turbulent level are generally independent of throughput.

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**3,652,062**

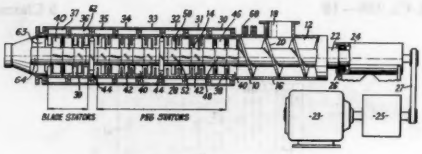
## MIXING APPARATUS

**Donald E. Baker, Ruston Spencer, near Macclesfield, England, assignor to The E. T. Oakes Corporation, Islip, Long Island, N.Y.**

**Continuation-in-part of application Ser. No. 570,605, Aug. 5, 1966, now Patent No. 3,456,599. This application Apr. 2, 1969, Ser. No. 812,706**
**Claims priority, application Great Britain, Apr. 8, 1968, 16,871/68**
**Int. Cl. B01f** *7/04*
**U.S. Cl. 259—9** **7 Claims**

A rotor for mounting on the shaft of an axial flow kneading machine between two series of kneading elements has radially inner and outer sets of blades which are inclined in opposing senses respectively, so that, in use, the radially inner layers of material kneaded by the first series of kneading elements will be decelerated by the inner set of rotor blades and

displaced outwardly before being advanced through the second series of kneading blades, while the radially outer layers of such material will be correspondingly accelerated and displaced inwardly.

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**3,652,063**

**MIXER**

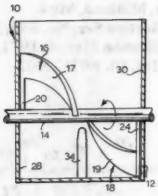
**Robert Lawson, Amersham, and Kenneth Oulton, Newton-le-Willows, both of England, assignors to T. & T. Vicars Limited, Earletown, Newton-le-Willows, England**

**Filed June 8, 1970, Ser. No. 44,438**

**Claims priority, application Great Britain, June 14, 1969, 30,273/69**

**Int. Cl. B01f 7/02**

**U.S. Cl. 259—109** **11 Claims**



A mixer having a single shaft, a pair of oppositely mounted helical blades rigidly attached to the shaft and a projection located between the blades, whereby in operation the blades move material in the mixer towards the projection and one another thus effecting thorough mixing of the material which may be a dough such as bread dough or sweet biscuit dough.

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**3,652,064**

**APPARATUS FOR CONVEYING PLASTIC MATERIAL**

**Josef Peter Lehnen, Verlautenheide by Aachen; Hans G. L. Menges, Laurensberg by Aachen, and Engelbert G. Harms, Vaalserquartier by Aachen, all of Germany, assignors to Uniroyal Engelbert Deutschland AG, Aachen, Germany**

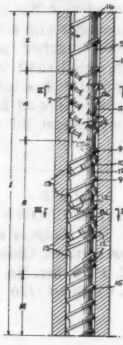
**Continuation-in-part of application Ser. No. 808,543, Mar. 19, 1969, now abandoned. This application Mar. 5, 1970, Ser. No. 16,769**

**Claims priority, application Germany, Mar. 12, 1969, P 19 12 459.5: Austria, Mar. 22, 1968, A 2858/68**

**Int. Cl. B01f 7/02**

**U.S. Cl. 259—109** **11 Claims**

A screw conveyor for an extruder comprises a single rotatable screw which has a countercurrent first portion having a countercurrent land with interruptions therein for partially backfeeding plastic material to provide a turbulent current of plastic material. The screw conveyor has a second portion with two threads, one of which has radial grooves therein, to divide the current into partial streams flowing backwards but having further travel under a substantially steady forward feed to compact and intensively mix the plastic material.



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**3,652,065**

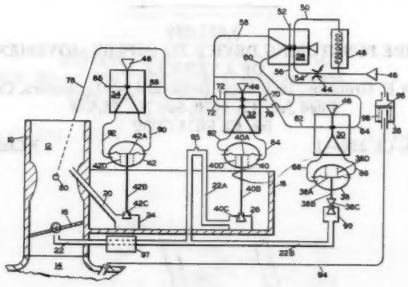
**FLUIDIC CONTROLLED CARBURETOR**

**Edward H. Casey, and James T. Bickhaus, both of St. Louis, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.**

**Filed Jan. 5, 1970, Ser. No. 742**

**Int. Cl. F02m 1/14**

**U.S. Cl. 261—39 R** **14 Claims**

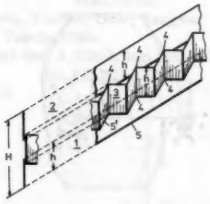


A carburetor having a mixing chamber, fuel bowl and fuel circuits is provided with fluidic control elements to control fuel flow for all normal driving conditions as well as for transient conditions such as cranking, warm-up, acceleration and deceleration. The fluidic elements control the fuel flow to compensate for altitude variations, and also control the air supply for cranking and warm-up. Pneumatically operated pure fluid amplifiers respond to vacuum signals from the engine manifold and mixing chamber and produce output signals for controlling valves located in the fuel circuits.

## 3,652,066
## PACKING FOR A COOLING TOWER

Heinz Faigle, Sagenkanal 15, 6971 Hard (Vorarlberg), Austria

Filed July 6, 1970, Ser. No. 52,468
Claims priority, application Austria, July 14, 1969, A-6722/69
Int. Cl. B01f 3/04
U.S. Cl. 261—109 10 Claims

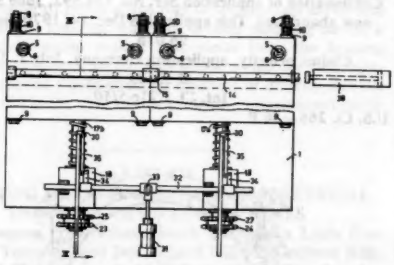


A packing for a cooling tower is assembled from elements of sheet material in which horizontally elongated flat strips and corrugated or accordion folded strips are combined. Water supplied to the top of the packing assembly flows in a film over the surfaces of the strips and drips from their edges to impinge on lower elements.

## 3,652,067
## FURNACE FOR HEATING BARS, TUBES OR SIMILAR OBLONG ARTICLES

Henri Joseph Timmermans, Helmond, Netherlands, assignor to Nedschroef Octrooi Maatschappij N.V., Helmond, Netherlands

Filed May 20, 1970, Ser. No. 39,036
Claims priority, application Netherlands, May 22, 1969, 69-07877
Int. Cl. F27d 3/00
U.S. Cl. 263—7 13 Claims

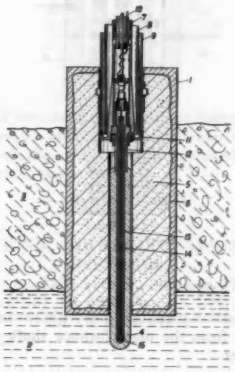


For preparing material that must be pressed or forged furnaces are used to heat said material. Said furnaces comprise a steel jacket in which a brickwork of refractory bricks is provided forming the so called furnace chamber. The articles to be heated are position in said furnace chamber into which burners for liquid or gaseous fuel discharge. An exhaust for combustion gases is provided and also supply means and discharge means for the articles to be heated. The furnace described comprises an elongated heating chamber, an exhaust passageway for combustion gases located alongside and extending lengthwise of the heating chamber and means for supplying elongated articles to be heated to the exhaust gas passageway to move transversely therethrough in contact with the hot gases and then into the heating chamber.

## 3,652,068
## REFRACTORY HOLLOW BODY

Meinhard Truppe; Matthias Scherrnthaner, and Gunter Poferl, all of Linz, Austria, assignors to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft, Linz, Austria

Filed Nov. 5, 1969, Ser. No. 874,258
Claims priority, application Austria, Nov. 18, 1968, A 11179/68
Int. Cl. F27d 21/00
U.S. Cl. 263—50 8 Claims



The invention relates to a refractory hollow body serving especially as protection for probes or lances with which the progress of metallurgical processes is tested, to a method for producing such hollow body and to a device useful in carrying out such method. The high demands placed in such protection jacket are met by providing two layers for the refractory hollow body, i.e., an inner layer of unsintered refractory mass, containing 25 – 35 percent of fine particles and 30 – 40 percent of coarser particles, and a dense, sintered outer layer of the same material, the thickness of said outer layer amounting to preferably from one-sixth to one-tenth of the wall thickness of said body. Such jacket body, whose total porosity preferably amounts to 15 – 20 percent is produced by forming a hollow cylindrical body out of a granular, refractory mass under the addition of water and consolidation by shaking, drying said body and burning said outer layer to become dense at a temperature higher than the sintering temperature, while said inner layer is cooled by a coolant.

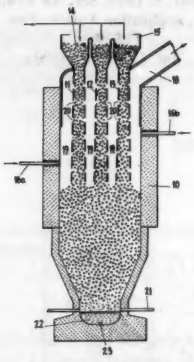
## 3,652,069
## SHAFT FURNACE SMELTING OF OXIDIC ORES, CONCENTRATES OR CALCINES

Howard K. Worner, North Balwyn, Victoria, Australia, assignor to Conzinc Riotinto of Australia Limited, Melbourne, Victoria, Australia

Filed Oct. 6, 1969, Ser. No. 864,051
Claims priority, application Australia, Oct. 15, 1968, 44834/68
Int. Cl. C21b 7/02
U.S. Cl. 266—25 15 Claims

Method and apparatus for direct shaft furnace smelting of oxidic ores, concentrates or calcines, the method comprising causing a pelletized or briquetted mixture of the ore or concentrate or calcines and coal to gravitate slowly downwards first through one or more carbonizing columns having holes or slots in the walls thereof and then through a main furnace shaft therebeneath, introducing oxygen-containing gas into a combustion chamber surrounding or partly surrounding the carbonizing column or columns to effect substantial com-

bustion of tars and combustible gases emerging through the holes or slots from the descending material in the carbonizing column or columns, withdrawing the products of combustion



from the combustion chamber, and withdrawing the metal or alloy produced from the main furnace shaft; and apparatus adapted therefor.

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**3,652,070**

**COOLING ASSEMBLY FOR BLAST FURNACE SHELLS**

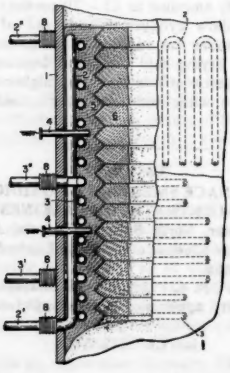
**Hideo Sagara, Hiroshima-shi, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 16, 1969, Ser. No. 866,974**

**Claims priority, application Japan, Oct. 22, 1968, 43/76927**

**Int. Cl. F27b *1/24***

**U.S. Cl. 266—32** **7 Claims**



On the inside of a steel shell of a blast furnace there is provided a wall made of a refractory material having a high heat transfer characteristic, such as silicon carbide. Steel pipe loops for circulating a cooling medium are embedded in the wall and temperature sensing means within the refractory material check the temperature adjacent the pipe loops.

**3,652,071**

**TILTABLE CONVERTER SUPPORTING MECHANISM**

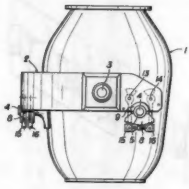
**Heinz Gruber, Neuhofen, Krems, Austria, assignor to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft, Muldenstrasse Linz, Austria**

**Filed Oct. 15, 1970, Ser. No. 81,052**

**Claims priority, application Australia, Apr. 16, 1970, A 3456/70**

**Int. Cl. C21c *5/50***

**U.S. Cl. 266—36 P** **10 Claims**



The invention relates to a tiltable converter comprising supporting trunnions fixed to the converter shell and a bearing structure surrounding the converter shell for at least half of its circumference, the supporting trunnions being mounted in bearing bushings which are releasably connected with the bearing structure, in which the improvement resides in that the bearing bushings are attached to the bearing structure by means of drawing hooks which are slewable in and out of an engagement position. Suitably, at least two pairs of hinged drawing hooks are provided per supporting trunnion and are capable of being tightened together by a common turnbuckle under exertion of a clamping force urging said bushing and trunnion against said converter bearing structure.

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**3,652,072**

**SUPPORT ARRANGEMENT FOR METALLURGICAL VESSEL SUCH AS STEEL MILL CONVERTER**

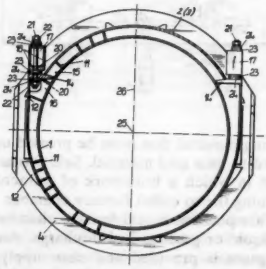
**Siegfried Stresemann, Rheinhausen; Karl-Heinz Langlit, Mulheim/Ruhr, and Karl-Heinz Mahringer, Duisburg-Hamborn, all of Germany, assignors to Demag Aktiengesellschaft, Duisburg, Germany**

**Continuation of application Ser. No. 734,592, June 5, 1968, now abandoned. This application Dec. 14, 1970, Ser. No. 98,016**

**Claims priority, application Germany, July 1, 1967, D 53503**

**Int. Cl. C21c *5/50***

**U.S. Cl. 266—36 P** **8 Claims**



A supporting ring for metallurgical vessel, such as a tiltable or revolvable steel mill converter, includes straps secured around the periphery of the vessel and in heat exchange relation therewith. These straps are connected to a support ring for the vessel, which also surrounds the vessel but is not in

heat exchange contact therewith. The supporting arrangement includes adjustable connecting screws which have a hinge-like connection at one end to the supporting ring, for displacement in at least a radial plane, and the other ends of which screws are hingedly connected to the projections of the vessel shell or wall, such as projections on the straps.

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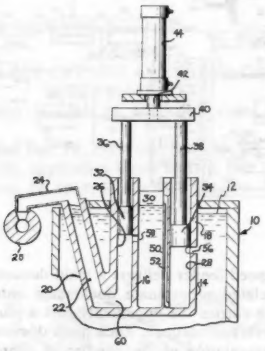
**3,652,073**

## AUTOMATIC LADLING SYSTEM FOR DELIVERING MOLTEN METAL FROM FURNACE TO DIE CASTING MACHINE

**Dong Sing Lewis, Toledo, Ohio, assignor to Gerity-Schultz Corporation, Toledo, Ohio**

**Filed Oct. 1, 1969, Ser. No. 862,794**
**Int. Cl. B22d *17/10***
**U.S. Cl. 266—38** **4 Claims**



An automatic ladling system for a cold-chamber, low pressure type die casting machine and permanent molding machines including a housing which is adapted to be submerged in a reservoir of molten cast metal, and a dual piston pumping mechanism structured for synchronous actuation and located in the submerged housing, the first pumping device serving to pump a quantity of molten cast metal into the submerged housing, while the second pumping device is structured to pump molten cast metal from the housing through a gooseneck to the shot sleeve at the die cast injection chamber of a cold-chamber machine or directly into the casting mold in the case of low pressure or permanent molding.

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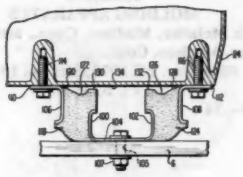
**3,652,074**

## MOUNTING MEANS FOR ISOLATING VIBRATIONAL ENERGY IN CHAIN SAW MACHINES

**Robert Eugene Frederickson, South Gate; John Louis Zimmerer, Torrance, and Jay Richard Bailey, Woodland Hills, all of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.**

**Filed June 26, 1970, Ser. No. 50,164**
**Int. Cl. F16f *15/08***
**U.S. Cl. 267—137** **6 Claims**

An improved resilient mounting means for connecting first and second assemblies of a chain saw machine. The first assembly generates mechanical vibrations and may include an internal combustion engine, a cutting chain with a guide bar and a drive system. The second assembly comprises an inertia mass and may include a fuel tank and a carburetor. The improved resilient mounting means is disposed between the two assemblies and a handle network may be provided to define a cagelike structure connected with the second assembly. The first assembly is resiliently supported within the cagelike network by the mounting means which integrally incorporates both vibrating absorbing and movement limiting features. The mounting means may be arranged to absorb vibration in shear during the normal running of the chain saw and to absorb shock energy generally in compression during



brief periods of unusual loading. In one independent feature of the invention, an additional snubber unit may be used in combination with the unitized vibration absorbing and movement limiting mounting means.

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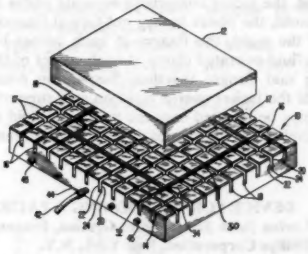
**3,652,075**

## VACUUM CHUCK AND RELATED APPARATUS AND METHODS

**Sheldon Thompson, 2187 12th St., Sarasota, Fla.**

**Filed Nov. 10, 1969, Ser. No. 875,103**
**Int. Cl. B25b *11/00***
**U.S. Cl. 269—21** **17 Claims**



A vacuum chuck having a work face including a plurality of linearly extending parallel passages or grooves intersecting each other at right angles to form a rectangular grid pattern. The grooves are dimensioned to receive an elongated rubber sealing member having a closed cell construction. The sealing member is discontinuous so that it may be placed in various different grooves to define a continuous seal in the work face of the chuck with the area enclosed by the sealing member being dependent on the size of the workpiece to be held by the chuck. Passages are provided in the chuck to communicate with the grooves inwardly of the sealing member for transmitting a vacuum in the area enclosed by the seal under the work piece. When handling very thin workpieces, a conversion plate is placed on the work face of the chuck in engagement with the sealing member. The thin workpiece is then placed on the conversion plate and held thereon by vacuum transmitted to the bottom of the work piece by apertures in the conversion plate which register with grooves in the chuck inwardly of the seal. When the work piece is very small in overall length and width, it is positioned by placing it in an aperture of similar shape formed in a "-block-in" plate which rests on a conversion plate. The bottom surface of the work piece rests on the conversion plate, and vacuum is applied to the bottom of the work piece through apertures in the conversion plate. The chuck may also be adapted for profiling work pieces by placing an aper-

tured conversion plate on the chuck inwardly of the sealing member. The work piece extends beyond the edges of the conversion plate and in spaced relation to the work face of the chuck to provide sufficient space for profiling.

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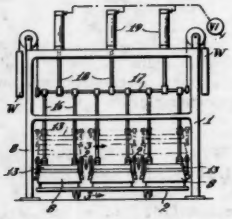
**3,652,076**

**MOLDING APPARATUS**

**Edwin Ralph McIntier, Madison, Conn., assignor to Richard G. Sweitzer, Madison, Conn.**

**Filed Mar. 16, 1970, Ser. No. 19,881**
**Int. Cl. B23q** *3/08*
**U.S. Cl. 269—24** **6 Claims**



Molding apparatus comprising a mold support, a jacket for the mold, the jacket comprising separate plates for the sides of the mold, the plates having out-turned flanges at the corners of the mold, the flanges at each corner being spaced apart, a fluid-operated clamp at each corner of the jacket for drawing said flanges together. Suspension means movably suspends the jacket over a mold on said support so that the jacket may be lowered over the mold, and fluid is simultaneously admitted to the clamps at the corners of the mold.

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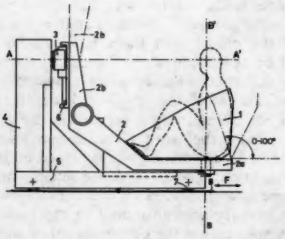
**3,652,077**

**DEVICE FOR POSITIONING A PATIENT**

**Pierre Lucien Jules James, Saint Gratien, France, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Feb. 20, 1970, Ser. No. 13,105**
**Claims priority, application France, Feb. 24, 1969, 6904704**
**Int. Cl. A61g** *13/00*
**U.S. Cl. 269—322** **8 Claims**



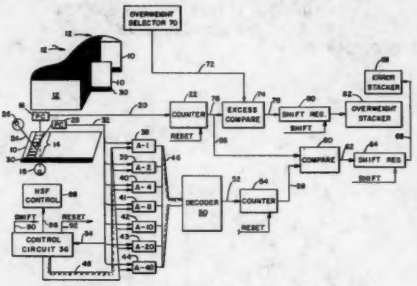
Apparatus for supporting and positioning a patient including a support on which the patient is seated that is rotatable about a horizontal axis and also movable vertically to vary the distance to said axis.

**3,652,078**

**SELECTIVE INSERTION MACHINE HAVING VERIFICATION AND OVERWEIGHT DIVERSION**

**Eugene Sather, Washington; Lester H. Stocker, Phillipsburg, both of N.J., and Kenneth A. Hams, Easton, Pa., assignors to Bell and Howell Company, Phillipsburg, N.J.**

**Continuation-in-part of application Ser. No. 657,721, July 14, 1967, now Patent No. 3,484,100. This application Oct. 20, 1969, Ser. No. 867,702**
**Int. Cl. B65h** *39/02*
**U.S. Cl. 270—58** **17 Claims**




A high speed feeder delivers a main document and a plurality of related subordinate documents onto an insertion track which carries the documents past a plurality of insertion and diversion stations. Each main document includes a coded representation of the number of related subordinate documents that are to follow thereafter. The coded representation is sensed as the main document is fed from the high speed feeder and signals are generated and delivered to a counter for representing a count corresponding to the number represented by the code. A photocell senses each subsequent subordinate document as it passes thereover and delivers a pulse corresponding to each such subordinate document to a second counter. The outputs of the two counters are compared and an error signal is generated if the two counts are not in agreement.

In accordance with another aspect of the invention, an overweight selector produces signals representing a predetermined number of subordinate documents. These signals are delivered to a means for comparing the numeric value they represent with the count in the second counter and providing an "overweight" output signal to an overweight-stacker when the actual count exceeds the predetermined number. In this manner, when a packet of documents contains an excessive number of subordinate documents, the packet is removed from the insert track by the overweight-stacker.

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**3,652,079**

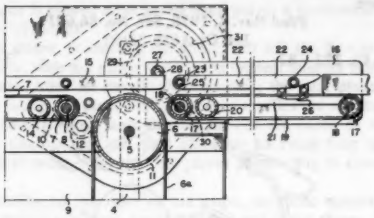
**MOVABLE INFEED CONVEYOR FOR SHEET COLLATOR DEVICE**

**Donald L. Snellman, and Ronald W. Greene, both of Seattle, Wash., assignors to Norfin, Inc., Seattle, Wash.**

**Filed Aug. 1, 1969, Ser. No. 847,538**
**Int. Cl. B65h** *39/02, 29/58*
**U.S. Cl. 270—58** **5 Claims**

An infeed conveyor attached to the infeed end of a sheet collator device and interconnecting the outfeed station of a copy machine with the infeed station of the collator is made so that it can be moved from an operative position to an inoperative position for access to the copy machine without moving either the copy machine or the sheet collator device. The infeed conveyor is powered by the drive train of the sheet collator device and is either pivotally attached to the

frame of the collator device or adapted to ride in vertical slots in the frame of the collator device from which position



it can be raised and slid over the top of the sheet collator device.

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**3,652,080**

**APPARATUS FOR CUTTING AND FOLDING FLEXIBLE SHEET MATERIAL**

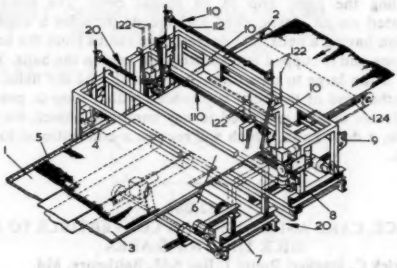
**Kenneth Thomas Jenkins, 14, Blackfield Lane, Salford, 7, England**

**Filed Dec. 18, 1969, Ser. No. 886,269**

**Claims priority, application Great Britain, Dec. 24, 1968, Dec. 24, 1969; 61,509/68, 61,510/68**

**Int. Cl. B65h** *45/22*

**U.S. Cl. 270—61 R** **27 Claims**



Apparatus and a method for continuously measuring and transversely cutting into separate units flexible sheet material and particularly textile material as manufactured, folding the material adjacent a cut edge into a hem and temporarily securing folded hems in readiness for permanent securing.

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**3,652,081**

**SHEET COUNTERS**

**Yoshihiro Hatanaka, Himeji; Masahiro Abe, Tokyo-to; Takeo Oshima, Tokyo-to, and Yoshio Akioka, Tokyo-to, all of Japan, assignors to Kabushiki Kaisha Kokuei Kikai Seisakusho, Himeji-shi and Glory Kogyo Kabushiki Kaisha, Tokyo-to, Japan**

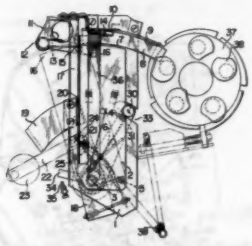
**Filed June 23, 1970, Ser. No. 49,019**

**Claims priority, application Japan, June 24, 1969, 44/59821; 44/49357; 44/59824**

**Int. Cl. B65h** *3/42*

**U.S. Cl. 271—27** **3 Claims**

Improvements in a sheet counter for use in counting bank notes and so forth, comprising a sheet holding mechanism and a sheet counting mechanism which includes a counting rotor having a plurality of rotary suction drums for successively separating by suction the sheets held in a pack in the sheet holding mechanism. The two primary improvements concern the sheet holding and sheet counting mechanisms, respectively, one being a device for securely holding a pack of sheets between a sheet holder plate and a holder check bar. The other is a device for stopping the counting rotor at the end of each counting operation in such a manner that one of its rotary suction drums is directed squarely toward



the next pack of sheets to be counted. Instead of piano wire, as in the prior art, a solid bar complete with exclusive shock absorber means is employed for this purpose and slides over the periphery of the counting rotor until it drops into one of its notches.

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**3,652,082**

**DEVICE FOR FEEDING LABELS INTO LABELING MACHINES**

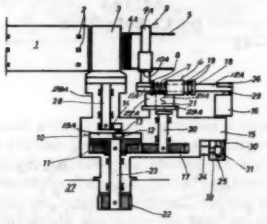
**Erich Eder, Neutraubling, Germany, assignor to Hermann Kronseder, Neutraubling, Germany**

**Filed June 29, 1970, Ser. No. 50,440**

**Claims priority, application Germany, July 7, 1969, P 19 34 399.8**

**Int. Cl. B65h** *3/06;* **B32b** *31/00*

**U.S. Cl. 271—36** **11 Claims**



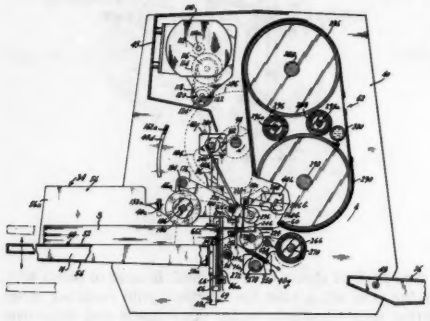
An integrated assembly of apparatus for feeding labels to a container labeling machine includes a variable speed label-transfer roller which rotates at a slow speed when picking up a label and a higher speed when transferring the label to a label turret, and a label magazine which is advanced in a tangential path toward the transfer roller and retracted clear of the path by a guide which is yieldably connected to the label magazine and rotated by a crank. When a container is not present in the feed path to the label turret, the movement of the label magazine toward the transfer roller is prevented by a blocking arm which is actuated by a rotary solenoid. The yieldable connection between the guide and the label magazine affords relative movement between the guide and the label magazine when the magazine is blocked and the guide continues to rotate.

3,652,083

## PAPER FEED MECHANISM

William Bosshardt, Armonk, N.Y., assignor to John Benton Inc., Mineola, N.Y.

Filed Oct. 31, 1969, Ser. No. 873,042
Int. Cl. B65h 3/06
U.S. Cl. 271—39 26 Claims



A twin cylinder stencil duplicating machine including a corner separator paper feed mechanism having a single knob adjustment for establishing different degrees of interference for various paper stocks and operating conditions such as machine speed.

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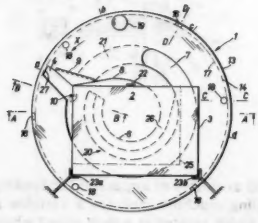
3,652,084

## APPARATUS FOR SEPARATING A STACK OF FLAT ARTICLES INTO SINGLE ARTICLES

Jurg Eberle, Zurich, Switzerland, assignor to Ferag, Fehr and Reist AG, Hinwil, Zurich, Switzerland

Filed Apr. 20, 1970, Ser. No. 29,913
Claims priority, application Switzerland, Apr. 29, 1969, 6523/69
Int. Cl. B65g 59/06
U.S. Cl. 271—41 8 Claims



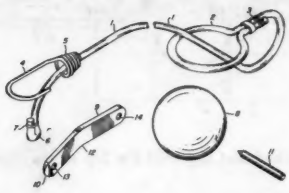
An apparatus for removing articles one-by-one from a stack comprises a rotating table on which the stack is placed, the stack being held still. The table is formed with an opening through which the lowermost article in the stack passes on each revolution of the stack. The stack covers the axis of rotation of the table and the opening is specially shaped with a central hole connected by a generally radial slit to a part annular slit, the radial slit extending outwardly of the part annular slit to pass the article through the opening.

3,652,085

## ELASTIC TYPE ARM EXERCISING DEVICE

Jon F. Cole, Scottsdale, Ariz., assignor to Michel Civalier; Gerald T. Civalier and William T. Civallier, part interest to each

Filed Nov. 4, 1970, Ser. No. 86,681
Int. Cl. A63b 21/00
U.S. Cl. 272—82 3 Claims



An exercise device is provided for developing and strengthening the arm muscles, particularly those muscles associated with the act of throwing. The apparatus includes sphericalhand grip spherical hand to one end of an elastic cord to which structure is provided at the other end for anchoring the apparatus to a relatively immobile object of restraint. An elongated, flattened member extends into the interior of the spherical hand grip and is secured by a pin passing transversely through an aperture near the end of the member within the hand grip. A second aperture near the protruding end of the elongated member receives a hook for coupling the hand grip to an elastic cord. The hook is mounted on an elastic cord and means includes a cuplike portion having a helix that decreases in radius from the hand grip one end is cupped and knotted and held in the helix. The knot is too large to pass through the small end the helix. At the other end of the cord is provided with a loop to permit the device can be anchored to any immobile object, for example, a door knob, which will receive a conventional loop-hitch.

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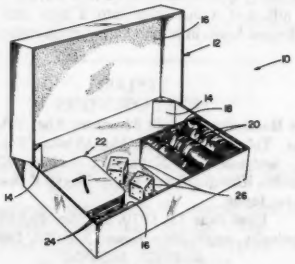
3,652,086

## DICE, CARD AND TOKEN BOX CONVERTIBLE TO A DICE THROWING AREA

Merrick C. Stecker, Route 1, Box 645, Baltimore, Md.

Filed Dec. 10, 1970, Ser. No. 96,756
Int. Cl. A63f 9/04
U.S. Cl. 273—1 R 5 Claims



A new and novel game is provided which consists of a box which subsequently assembles into a die throwing area. The box includes a token container having 120 tokens of various denominations, such as ten, five, and one. Two dies are also included in the box, together with a deck of cards numbered 1–12 of which there are four each making a total of 48 cards. The inner horizontal surface of the box is lined with a sound

absorbent material such as felt. The bottom half of the box has two tabs attached to its opposed vertical sides. These tabs provide a lock for keeping the top half of the box in the same plane as the bottom half, once the box has been unfolded. The game is played after giving each player a predetermined number of tokens.

Each player, in starting the game, will roll the dice in the game box, with the player having the highest number starting the game. After he has finished his play, the next player to his left makes his play. The first player shuffles the numbered cards (face down), and then deals out six cards to each player. Each player will then place his six cards face up in numerical order, with the first player proceeding to cast the dice.

According to the rules of the game, only one number of each player's numbers, equalling the total of the throw, may be turned over. In the case of doubles showing on a throw of the dice, the total of the throw can be used or the number of one die shown can be played. Play of the game continues until a player succeeds in having all numbered cards face down across the board; that player is declared the winner of that round of play. The remaining players then total their remaining numbered cards and pay this amount in token to the winner. This constitutes one round of play. Next, the numbered cards and dice are then given to the second player and a new round of the game is started. The player ending up with all the tokens is the official winner, with any player running out of tokens during the course of play, being automatically eliminated.

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**3,652,087**

## GAME APPARATUS

**William L. Carmen, 335 Alma, Palo Alto, Calif.**

**Filed Feb. 11, 1969, Ser. No. 798,287**
**Int. Cl. A63f 9/00**
**U.S. Cl. 273—1 R** **3 Claims**

Apparatus for playing a game with a number of participants wherein the apparatus includes a number of flexible cord-like members, each member being of a different color for identifying it with a respective participant and loops at each end thereof for releasably connecting the same to a body part of a participant. Each member has beads bearing game instruction indicia thereon to indicate the play of the game wherein the participants successively make moves which cause them to become intertwined. In one form of the invention, the members are separate from each other and in a second form of the invention, the members are coupled together.

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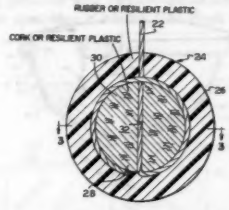
**3,652,088**

## TETHERED BALL BASEBALL BATTING PRACTICE DEVICE

**Loyal F. Marsh, 8535 S.W. Woodside Drive, Portland, Oreg.**

**Filed Oct. 21, 1969, Ser. No. 868,095**
**Int. Cl. A63b 69/40**
**U.S. Cl. 273—26 E** **8 Claims**

A baseball or softball batting practice device has a rope trackway along which a pulley carriage is adapted to travel freely. A simulated baseball or softball is suspended by a length of nylon cord from the carriage. A batter strikes the ball to cause the carriage to travel along the trackway and endeavors to hit the ball again as the carriage returns toward




the batter along the trackway. In a preferred embodiment the ball has a solid cork center core and a molded urethane elastomer shell surrounding the cork core. One end of the nylon cord extends through and is wrapped once about the core and embedded in the urethane shell.

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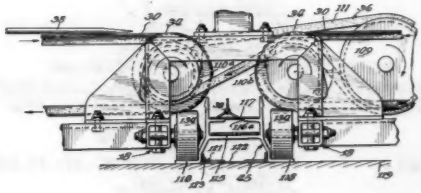
**3,652,089**

## ARROW RETURN COVEYOR

**Thomas W. O'Connor, Ravenna, Mich., assignor to Brunswick Corporation**

**Filed June 6, 1969, Ser. No. 831,081**
**Int. Cl. F41j 1/18**
**U.S. Cl. 273—103** **4 Claims**



An automated archery range including a firing line from which arrows are shot toward a penetrable target, a backstop behind the target for stopping arrows, an arrow collector beneath the backstop, a disassemblable and removable arrow return conveyor for receiving arrows from the collector and returning them toward the firing line, and an arrow storage quiver adjacent the firing line for receiving arrows from the conveyor and storing the arrows in upright positions readily accessible to the archer. The conveyor includes a horizontal channel, an endless conveyor belt comprising a stretchable band guided in the channel, means for driving the belt, wherein the channel comprises a plurality of separable sections, arranged end to end for assembly and disassembly, and releasable means for holding the channel sections together.

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**3,652,090**

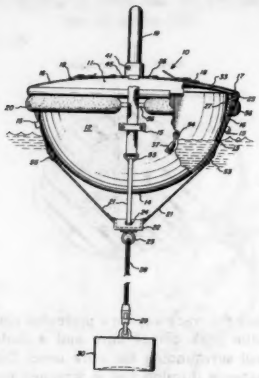
## FLOATING GAME TARGET

**Richard W. Semmens, 10640 Wren St., Coon Rapids, Minn.**

**Filed Oct. 28, 1970, Ser. No. 84,563**
**Int. Cl. A63b 63/00**
**U.S. Cl. 273—104** **10 Claims**

A recreational device comprising a generally bowl shaped base which has a density permitting the floatation of said base in a body of water, an upright elongated member projecting from the top of said base and above the surface of

said water, and a plurality of elastic members connected at one end with said base and at the other end with an anchor



means for maintaining the recreational device in a stable position when it is used as a game target in the water.

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**3,652,091**

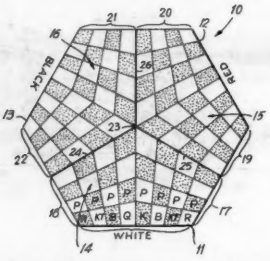
**THREE PLAYER CHESS BOARD**

**Robert Zubrin, 3 Vista Drive, Great Neck, N.Y.**

**Filed Jan. 6, 1971, Ser. No. 104,439**

**Int. Cl. A63f** *3/02*

**U.S. Cl. 273—131 B** **2 Claims**




A game board for simultaneous play of chess or the like by three players. The board is in the shape of a hexagon and is divided by transverse and longitudinal lines into three discrete territories, each of which territories includes 32 play spaces. Each territory includes a base defined by a side of said hexagon, side borders defined by half of each of the sides of the hexagon adjacent the base and frontier borders defined by lines extending from the terminal ends of the sides remote from the base to the geometric center of the hexagon. Each territory is defined into 32 play spaces by longitudinal lines extending from the base to the frontier borders and transverse lines extending from the sides to an apex line running from the center of the base.

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**3,652,092**

**ASTROLOGY BOARD GAME APPARATUS**

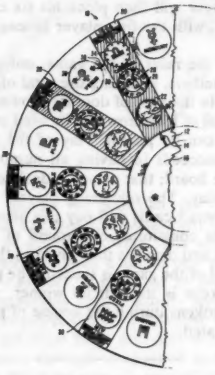
**Richard G. Boyer, and Lola Elizabeth Boyer, both of 735 Hawthorne Ave., Hollywood, Calif.**

**Filed Oct. 24, 1969, Ser. No. 869,009**

**Int. Cl. A63f** *3/00*

**U.S. Cl. 273—134 C** **8 Claims**

An astrology game board comprising a flat stationary board having positioned on a surface thereof a circular indicator means rotatable about a fixed axis, disposed around said indicator means twelve radially extending bands, each of said bands having within its field in radially disposed fashion; an image of the earth having therein a orbiting flag receiving aperture, a plurality of zodiac sign symbols in circularly disposed arrangement, in proximity to each of said symbols a peg receiving aperture, and a plurality of peg receiving apertures in circularly disposed arrangement; between said bands and each associated with one of said bands a circularly



disposed degree scale, said scale having at regular increments a orbiting flag receiving aperture. Each of said bands is identified by a color associated with a particular zodiac sign. The bands are arranged in the cosmic order of the zodiac signs around the indicator means. The degree scale has at its center the planet symbol and name of the planet which cosmically rules the zodiac sign of the band associated with said scale. Alternatively, said indicator means may be deleted in favor of twelve suits of astrological playing cards.

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**3,652,093**

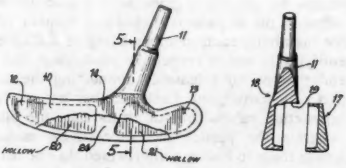
**GOLF PUTTER HEAD WITH HOLLOW TOE AND HEEL PORTIONS**

**John Reuter, Jr., Phoenix, Ariz., assignor to John Reuter, Jr. Inc., Phoenix, Ariz.**

**Filed July 20, 1970, Ser. No. 56,274**

**Int. Cl. A63b** *53/04*

**U.S. Cl. 273—169** **3 Claims**



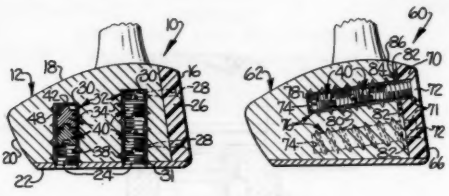

A golf putter head which is designed to make available to the player a relatively large mass at the ball-striking area of the putter face and the loft of a long iron club for putting a ball from just outside the green, while retaining the directional and power control for short putts. Undue increase in the weight of the putter which would result from the concentration of mass at the ball-striking area, and the unattractive bulge such concentration of mass would entail, are avoided by retaining the constant thickness of the usual putter over its entire length while making the heel and toe of the putter hollow.

3,652,094

## GOLF CLUB WITH ADJUSTABLE WEIGHTING PLUGS

Cecil C. Glover, P.O. Box 12705, Charlotte, N.C.

Filed Oct. 21, 1969, Ser. No. 868,000
Int. Cl. A63b 53/08
U.S. Cl. 273—171 8 Claims



A golf club having provision for adjusting the swing weight and balance of the club. The club head includes a plurality of elongated cavities, each of which mounts an internally threaded sleeve. One or more externally threaded plugs are threadedly retained in each sleeve, the plugs being adapted to be rotatably translated along the length of the sleeve, or entirely removed therefrom, to change the balance and/or swing weight of the club.

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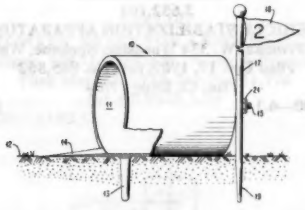
3,652,095

## GOLF GAME APPARATUS

Peter C. Furnari, 9 Maple Ave., Wappingers Falls, N.Y., and Samuel F. Furnari, 183 Glascoe Ave., Staten Island, N.Y.

Filed Apr. 22, 1970, Ser. No. 30,825
Int. Cl. A63b 67/02
U.S. Cl. 273—176 AA 5 Claims



A lawn golf game playable with ordinary golf clubs and balls or wiffle balls on any reasonable size lawn area in leisure time by individuals or competitive teams which requires all the skill of conventional golf. Receptacles are located in a predetermined pattern or course above ground for receiving the golf ball. Each receptacle is cylindrically shaped and includes one closed end, one open end for receiving a ball, a lip extension for facilitating the entry of a ball into the receptacle, a conical projection adjacent the open end for anchoring the receptacle in place, and a post at the closed end for supporting an identifying flag and anchoring the receptacle in place.

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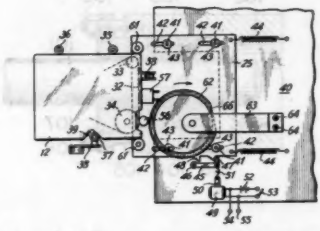
3,652,096

## CONTROL MEANS FOR MOVING DECK FOR TAPE CARTRIDGE PLAYING APPARATUS UTILIZING PLURALITY OF ENDLESS MAGNETIC TAPE CARTRIDGES

Itsuki Ban, 829, Higashi-Oizumimachi, Nerima-ku, Tokyo-to, Japan

Filed June 15, 1970, Ser. No. 45,961
Int. Cl. G11b 5/00
U.S. Cl. 274—4 F 6 Claims

Control means for moving a deck in a tape cartridge apparatus having a plurality of endless tape cartridges mounted on a movable container, the container being movable to bring the cartridges into the playing position in a predetermined sequence. Mounted on the deck are a rotary capstan for driving the tape in the cartridge in the playing position, and a magnetic head for transducing the tape. The deck is adapted to be reciprocated between a reproducing station where the capstan and the magnetic head play the cartridge in the playing position and a non-reproducing station where the play of the cartridge is ended. The deck may be retained by a first locking means in the reproducing station or by a second locking means in the non-reproducing station. The deck is moved into the non-reproducing station by the bias of a bias means when the first locking means releases retention of the deck. And, the deck is moved into the reproducing station against the bias of the bias means by a deck moving means having a frictional cam wheel rotatably driven abutting against the capstan when the second locking means releases retention of the deck.



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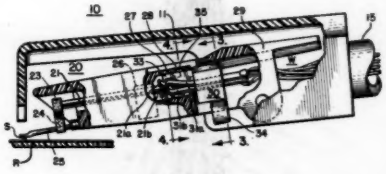
3,652,097

## PHONOGRAPH CARTRIDGE CONNECTOR

David Bella, Northlake, and Seymour Kessler, Wilmette, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed June 19, 1969, Ser. No. 834,707
Int. Cl. G11b 3/02
U.S. Cl. 274—37 2 Claims



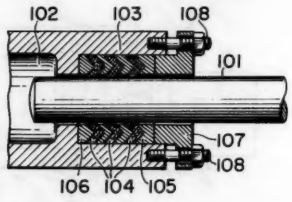
A simple and economical electrical connector plug for a phonograph pickup cartridge adapted to engage a rotating phonograph record and track the record grooves therein for translating the undulations of the grooves into corresponding electrical signals for application by wires to suitable electronic amplifying equipment. The detachable connector plug is provided with an indexing projection and electrical contacts connected to the wires and adapted to mate with the output signal contacts of the active element of the phonograph cartridge for coupling the electrical signals to the amplifying equipment.

3,652,098

## SEALING DEVICE FOR RECIPROCATING PUMP

Yoshio Kawazu, and Tadashi Egami, both of Chikushino-machi, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1970, Ser. No. 29,440
Claims priority, application Japan, Apr. 30, 1969, 44/33391
Int. Cl. F16j 15/18
U.S. Cl. 277—59 8 Claims



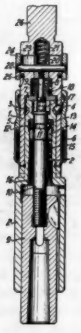

In a reciprocating pump, a stuffing box is providing through which a rod reciprocates. Adapter means and packing means are arranged in the stuffing box to effect a reduction in the pressure of the fluid flowing from the pump into the stuffing box. The packing means are arranged to form open spaces about the rod within which spaces pressure reduction takes place. Additional packing means are provided about the rod outwardly from the open spaces for providing the final sealing effect.

3,652,099

## DRILL CHUCK

Otto Bilz, Waldackerweg 8, Esslingen/Neckar, West, Germany

Filed Feb. 19, 1970, Ser. No. 12,633
Int. Cl. B23b 31/08
U.S. Cl. 279—1 B 11 Claims



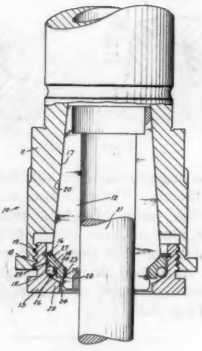
A drill chuck in which, when the pressure upon the drill exceeds an adjustable limit during a drilling operation, the drill holding means, for example, a tool socket, is released and moved axially in the direction toward the shank of the chuck so that the drill is relieved from pressure. Such a release of the tool socket or the like and its resulting movement is indicated on the outer slide of the chuck and may also actuate a switch to stop the machine tool.

3,652,100

## COLLET CHUCK

Walter Baturka, Frankenmuth, Mich., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed July 2, 1970, Ser. No. 51,885
Int. Cl. B23b 31/20
U.S. Cl. 279—51 8 Claims



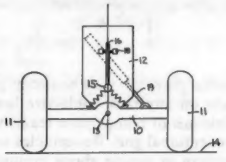
A collet chuck assembly includes a locknut and a nose ring that have confronting bearing races with a series of bearing elements therebetween, the nose piece and the collet having a line of engagement, and loose fitting threads enabling the line of engagement to find its own location.

3,652,101

## VEHICLE STABILIZATION APPARATUS

William J. Pivonka, W. 334 Woodside, Spokane, Wash.

Filed Dec. 17, 1969, Ser. No. 885,862
Int. Cl. B60g 17/04
U.S. Cl. 280—6.1 12 Claims



A controlled pendulum is utilized to automatically tilt a vehicle frame uphill to compensate for transverse inclination of the terrain on which the vehicle is riding. The normal gravitational forces exerted on the pendulum due to such transverse inclination are partially counteracted by tension forces proportional to the degree of inclination. The frame is thereby tilted uphill an angular amount in proportion to the amount of transverse inclination encountered. The vehicle frame is pivoted to a ground engaging structure about a longitudinal axis. The pendulum is pivoted about an elevated parallel axis. A pair of control devices are mounted to the frame to detect pendulum movement to either side of a plane containing said axes. Tension springs extend outwardly and downwardly from the pendulum to the vehicle's ground engaging structure. They serve to force the pendulum to an equilibrium condition at an angle relative to the vertical. The monitoring function of the control devices causes the frame to be aligned along this plane which is inclined uphill.

3,652,102

## SKI BOTTOM FINISHING METHOD

Earl V. Eaton, Petaluma, Calif., assignor to George E. Garcia, Novato, Calif.

Filed Mar. 5, 1970, Ser. No. 16,694
Int. Cl. A63c 5/12
U.S. Cl. 280—11.13 L 2 Claims

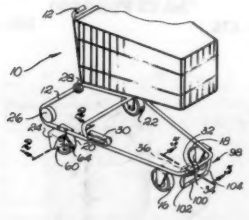
A method for making snow skis with a bottom surface that provides relatively low friction with snow. The method produces a multiplicity of small, elongated, irregular indentations or striations in the bottom ski surface without grinding or buffing the hard plastic material forming the surface. It can also be applied to produce grooves of a predetermined size. The method includes the steps of providing a sandwich of elements forming the ski structure including a bottom member of plastic material, providing a metal form or die having a multiplicity of elongated indentations or striations in an upper surface, placing the indented surface of the metal form against the surface of the bottom member, and applying heat and pressure in predetermined amounts for a period of time to press the form against the ski structure, and thereby imprint the surface pattern of the form on the surface of the bottom member.

3,652,103

## AUTOMATIC BRAKE FOR A SHOPPING CART

Stuart P. Higgs, 12533 Emelita St., North Hollywood, Calif.

Filed Mar. 23, 1970, Ser. No. 21,776
Int. Cl. B62b 5/04
U.S. Cl. 280—33.99 C 8 Claims



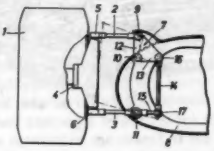
For a shopping cart having a frame mounted on roll-about wheels, an automatic lock which is released by a timing mechanism a predetermined period of time after actuation. A photoelectric cell is operatively associated with the timing mechanism so that a beam of light, e.g., at a store exit can actuate the mechanism. A rechargeable battery is included and male and female electrical connectors are disposed in opposite forward and rearward directions on the cart for mating engagement with counterpart connectors on other like-constructed carts stacked therewith, whereby recharging of the batteries of each stacked cart can be simultaneously accomplished from a single source of electrical power.

3,652,104

## INDEPENDENT WHEEL SUSPENSION FOR VEHICLES

Kurt Herwig Chabek, Munchingen-Kallenberg, Germany, assignor to Firma Dr.-Ing. Porsche, h.c.F.K.G., Stuttgart-Zuffenhausen, Germany

Filed Jan. 20, 1970, Ser. No. 4,235
Claims priority, application Germany, Feb. 12, 1969, P 19 06 864.5
Int. Cl. B60g 3/26
U.S. Cl. 280—96.2 R 31 Claims



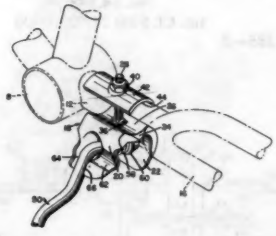
An independent wheel suspension for vehicles wherein the vehicle wheel is guided by means of upper and lower transverse wheel forks mounted at the vehicle frame so as to be pivotable about at least approximately horizontal axes. The lower transverse wheel fork is connected directly to the vehicle frame, while the upper transverse wheel fork is connected to the vehicle frame by means of a two-armed deflecting guide member. A torsion bar can be arranged in the longitudinal direction of the vehicle for wheel springing and can be disposed in the extension of the frame-side pivot axis of the lower transverse wheel fork.

3,652,105

## BICYCLE KICKSTAND

Robert F. Humlong, Maysville, Ky., assignor to Wald Manufacturing Company, Incorporated, Maysville, Ky.

Filed May 8, 1970, Ser. No. 35,639
Int. Cl. B62h 1/02
U.S. Cl. 280—301 11 Claims



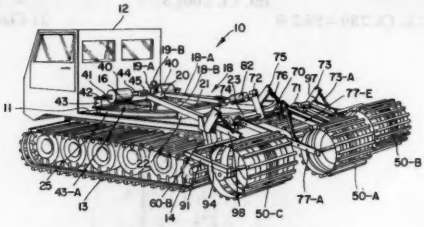
The kickstand includes simple quick-attachable means for a safe and effective mounting thereof upon a bicycle frame characterized by a single tubular shank member that connects the crank housing with the lower rear wheel fork of the frame; the mounting including a single fastener, and means to preclude mutilation or collapse of the shank member incident to installation and use of the kickstand.

3,652,106

## LOAD TRANSFERRING HITCH FOR A VEHICLE

Donald H. Waterman, Poland, Maine, assignor to Valley Engineering, Inc., Auburn, Maine

Filed Sept. 22, 1969, Ser. No. 859,945
Int. Cl. B62d 55/00, 53/06
U.S. Cl. 280—405 R 5 Claims



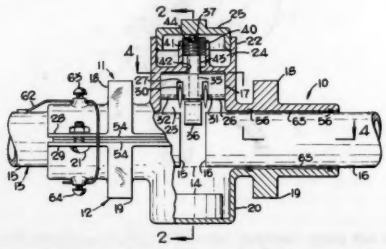
A hitch for a vehicle such as a track tractor, wheeled tractor or the like for attachment to a device to be drawn by the vehicle such as a snow roller, harrow or other drawn implement or towed load which does not interfere with manual or power steering of the vehicle by the customary steering devices and which, at the option of the operator, may be used to assist him in steering and also to steer the vehicle without using the customary manual or power steering devices. The preferred embodiment of the hitch also includes means by which the pressure of the device which is being drawn upon the surface of the earth, a snow surface or the like, may be varied to increase or decrease the effectiveness of the device in assisting in steering the vehicle with the manual or power steering devices or in steering the vehicle without using the customary steering devices. The hitch is also designed to accommodate power driven shafts to transmit power from the vehicle transmission to drive the device which is being drawn, which are so positioned relative to the vehicle and to the elements of the hitch that the need for universal joints and the like are eliminated.

3,652,107

## APPARATUS FOR SEVERING AND COUPLING A PIPE

Edward F. Tickett, El Paso, Tex., assignor to Alex B. Reynolds, St. Louis, Mo., a part interest

Continuation-in-part of application Ser. No. 864,739, Oct. 8, 1969, now abandoned. This application July 13, 1970, Ser. No. 54,398
Int. Cl. F16l 21/02, 21/06
U.S. Cl. 285—3 21 Claims



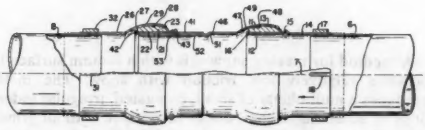
This apparatus provides a two-part rotatable housing which is mounted about a continuous gas or other pipeline for the purpose of cutting a section from the pipeline and coupling the separated parts together. The upper portion of the housing includes a built-in cutter assembly having a cutter advancing mechanism and the lower housing portion includes a cup for receiving the severed pipe section. The housing portions are separated by seals which facilitate rotation of the housing about the pipe during the cutting process. The seals prevent leakage from the pipeline and, in addition, electrically isolate the separated parts of the pipe.

3,652,108

## EXHAUST PIPE BALL CONNECTOR

David E. Coats, San Francisco, Calif., assignor to Western Piping & Engineering Co., Inc.

Filed Sept. 24, 1970, Ser. No. 75,104
Int. Cl. F16l 27/02
U.S. Cl. 285—165 5 Claims



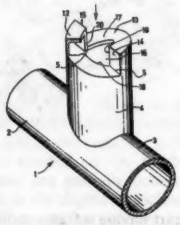
An exhaust pipe ball connector has two iron rings with outer spherical surfaces. A sheet metal exit sleeve has a spherical end embracing one ring. A sheet metal downstream tube is beaded and flanged to engage the inside of that ring. A sheet metal upstream tube at one end telescopes into the downstream tube, with an annular seal between the telescoping portions, and at the other end is spherical and embraces the other ring. A sheet metal entrance sleeve is beaded and flanged to engage the inside of the other ring.

3,652,109

## TUBULAR CONNECTING PIECE FOR HELICALLY GROOVED TUBES

Cornelis Van Zon, Zwolle, Netherlands, assignor to Industriele Onderneming Wavin N.V., Zwolle, Netherlands

Filed Nov. 4, 1969, Ser. No. 873,816
Claims priority, application Netherlands, Nov. 8, 1968, 6815986
Int. Cl. F16l 55/00
U.S. Cl. 285—176 4 Claims

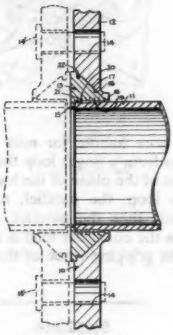


The invention relates to a tubular connecting piece for grooved tubes whereby one or more ends of the piece are at least partially closed by two end planes making an angle with respect to one another. Each end plane covers at least a part of the half section of one end of the connecting piece. The end edges of the end planes are connected by planes extending parallel to the longitudinal direction of the part of the connecting piece comprising said end planes.

## 3,652,110
## FORMATION OF JOINTS BETWEEN TUBULAR MEMBERS

Douglas N. Manton, 235 Ulverley Green Road, Olton, Solihull, England

Filed Mar. 5, 1970, Ser. No. 16,817
Int. Cl. F16l *25/00*
U.S. Cl. 285—328 9 Claims

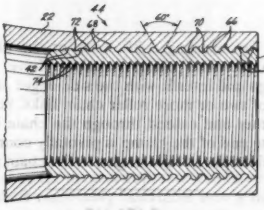


A fluidtight joint between a pair of aligned pipes is effected by the securing together of a pair of flanges mounted one on each of the pipes. Each flange is of composite form comprising a rigid outer part and a resiliently deformable inner part which fits around the surface of the end portion of the associated tubular member. In jointing of aligned pipes the flanges are juxtaposed with the resilient inner parts registering with each other. When the outer parts of the juxtaposed flanges are urged together each inner part is compressed to effect gripping engagement thereof with the associated pipe.

## 3,652,111
## METHOD OF SWAGE JOINING A METALLIC TUBE TO AN INSERT AND THE PRODUCT THEREOF

Robert K. Dent, 17765 Beach Drive, N. E., Seattle, Wash.

Filed Dec. 10, 1969, Ser. No. 883,904
Int. Cl. F16l *13/14*
U.S. Cl. 285—382 6 Claims



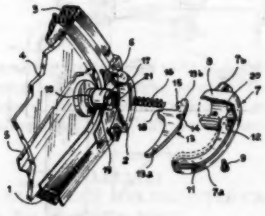
There is disclosed an insert of cylindrical shape and of substantially uniform predetermined diameter and length. This insert has a greater hardness than the tube to be employed. Thus, generally, the tube is an aluminum alloy tube and the insert is stainless steel to provide the desired comparative hardnesses. For convenience in handling of the insert during the process, a cylindrical, coaxial recess is drilled in the insert. A conventional thread-rolling device is provided with dies of a hardness greater than the insert and the pattern on the contacting surfaces of said dies is a plurality of annular, spaced, alternate crests and grooves. The crests and grooves are disposed in two longitudinally spaced sections and with the grooves and crests in the first section each having a common diameter and with the diameters of the crests and grooves in the second section each having gradually decreasing diameters. Such dies are used to form a pattern of annularly spaced grooves and crests on the surface of the insert. The crests in the first section of the dies imprint grooves in a first section on the insert and which grooves have a common diameter. The material displaced in the insert, in the imprinting and forming of such grooves, migrates laterally from the grooves or in a direction longitudinally of the insert and forms the crests of uniform diameter in the first section on said insert. The crests in the second section of the dies imprint grooves in a longitudinally spaced second section on the insert and which grooves have gradually increasing diameters. The material displaced in forming said grooves in said second section of said insert forms crests which are not fully formed and which gradually decrease in diameter. Next, and prior to swaging of a tube upon said insert, the insert is provided with a plurality of longitudinally extending grooves by imprinting the said insert with an appropriate tool thus causing said grooves and causing a raise of stock elsewhere of the insert by the same amount as the extent of the said grooves.

Thereafter, a tube end portion of less hardness than said insert is slidingly fitted over said insert and the tube is swaged to the insert. The crests of the insert imprint grooves in the tube and the material migrates to form crests in the tube. As the crests of the insert were formed by metal migrating from grooves to form the same, the said crests of said insert will cause grooves and concomitant migration of metal to form precisely the crests in the tube. In order to ensure against any possible slight voids, there is provided a slight migration over that necessary to form the crests in the tube mating with the grooves on the insert and the longitudinally extending ridges mating with the longitudinally extending grooves of the insert. This swaging provides for cold working of the aluminum of the tube and improves the strength qualities thereof.

## 3,652,112
## LOCKING DEVICE FOR A HINGED WINDOW IN A MOTOR VEHICLE

Pio Panelli, Pino Torinese, Italy, assignor to FIAT Societa per Axioni, Turin, Italy

Filed June 16, 1970, Ser. No. 46,668
Int. Cl. E05c *3/14*
U.S. Cl. 292—210 2 Claims

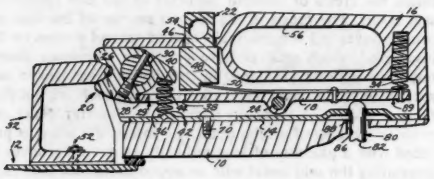


A hinged vehicle window has a rotatably mounted handle with an extension adapted to engage in a detent on the window frame. A locking device holds the handle in its closed position, and comprises a trigger lever mounted in the handle and having an arm that acts as a latch and engages in a groove in the pivot, and a spring biasing the trigger lever into the latching position. The trigger lever also has an actuating arm that is gripped by the operator when opening the window to release the latch arm from the pivot.

## 3,652,113
## DOOR LATCH ASSEMBLY WITH PUSHBUTTON ACTUATION

**Fortune Odend'hal, and Harry A. Jordan, both of Hagerstown, Md., assignors to Jamison Door Company, Hagerstown, Md.**

**Filed Aug. 25, 1969, Ser. No. 852,678**
**Int. Cl. E05c *3/26***
**U.S. Cl. 292—216** **9 Claims**

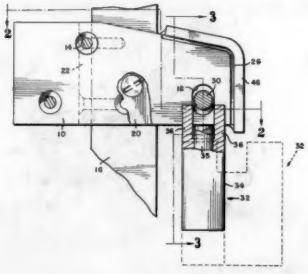


A door latch assembly is provided with a pushbutton actuation to release a lever plate from a pawl so that a door can be opened by free rotation of the pawl relative to a keeper. The lever plate is pivotally mounted within a housing which is secured with a base plate to the surface of the door, and the lever plate is normally urged into latching engagement with the pawl. The pushbutton contacts one end of the lever plate so as to move it out of engagement with the pawl. A separate releasing means, operable from an opposite side of the door from the position of the pushbutton means, contacts an opposite end of the lever plate so as to release the lever plate from the pawl without affecting the position of the pushbutton means. Thus, it is possible to release the door from the inside of a room even if the pushbutton means has been locked in a fixed position.

## 3,652,114
## SECURITY HASP

**James C. Cady, Indianapolis, and William R. Foshee, Noblesville, both of Ind., assignors to Best Look Corporation, Indianapolis, Ind.**

**Filed Nov. 13, 1969, Ser. No. 876,521**
**Int. Cl. E05b *67/38*; E05c *19/08***
**U.S. Cl. 292—281** **2 Claims**

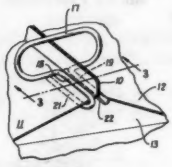


A security hasp for a door which when the door is closed projects forward along side a fixed keeper in position to be locked thereto by a padlock. For security a shrouded padlock is used having a lock case which shrouds its shackle and form a yoke embracing the hasp and keeper from below, and the hasp carries a hood which projects across the keeper and across the yoke opening of the padlock and thereby cooperates with the shrouds to shield the lock shackle from access by a cutting tool.

## 3,652,115
## DETACHABLE HANDLE FOR CONTAINERS

**Paul E. Grow, 2128 South Walnut St., Muncie, Ind.**

**Filed Feb. 17, 1971, Ser. No. 116,111**
**Int. Cl. A41j *45/07***
**U.S. Cl. 294—27 H** **2 Claims**

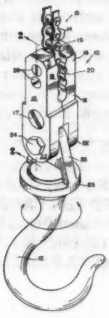


Disclosed is a wire handle for milk cartons or the like which is shaped to form a finger loop the end portions of the wire extending out of the plane of the loop and given a return bend toward the loop, the parallel, return sections being spaced wider apart than the parallel, outwardly extending sections so that as the container load is applied to the handle it will increase the gripping force of the handle on the container.

## 3,652,116
## LIFT CHAIN CONNECTOR

**Dana L. Pruitt, 209 N. Park St., Martinsville, Ind.**

**Filed May 25, 1970, Ser. No. 40,256**
**Int. Cl. B66c *1/34***
**U.S. Cl. 294—82** **6 Claims**



A clamp for securing a lift hook or the like to a roller chain. Two identical clamp members have grooved jaws which engage and interfit with the side edges of the 8-shaped side plates of two or more roller chain links. Screws hold the clamp together and extend through the chain link openings. The opposite end of the clamp is pivotally connected to a lift hook by a pivot pin at right angles to the chain pins.

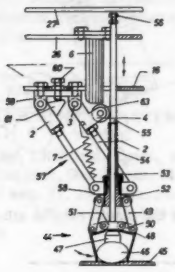
## 3,652,117
## EQUIPMENT FOR MANUFACTURING BAKERY PRODUCTS

**Herbert Schroder, Angerstrasse, Staffelstein Ofr, Germany**

**Continuation-in-part of application Ser. No. 609,628, Jan. 16, 1967, now Patent No. 3,448,865, dated June 10, 1969. This application Mar. 4, 1969, Ser. No. 804,084**
**Claims priority, application Germany, May 14, 1966, P 15 32 348.5. The portion of the term of this patent subsequent to June 10, 1986, has been disclaimed.**
**Int. Cl. B25j *3/00, 15/00*; B66c *1/44***
**U.S. Cl. 294—87 R** **4 Claims**

Grippers for picking up and depositing kneaded dough pieces comprise claws movable together and apart and

operable by bell crank levers. The levers of the claws of a gripper are actuated by a claw rod, with a plurality of claw



rods being actuated simultaneously by a common actuating plate.

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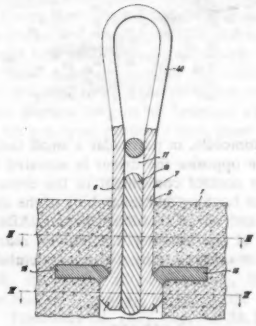
**3,652,118**

## LIFTING ANCHOR FOR PRECAST CONCRETE AND LIKE MOLDED PARTS

**Jurgen Goldberg, No. 7, Neuenburger Strasse, 78 Freiburg, Germany**

**Filed Oct. 1, 1969, Ser. No. 862,902**
**Claims priority, application Germany, Oct. 5, 1968, P 18 01 457.8**
**Int. Cl. B66c** *1/54, 1/66*
**U.S. Cl. 294—89** **12 Claims**



A lifting anchor for precast concrete and like molded parts comprises a shaft removably insertable into a hole provided in a molded part so as to extend substantially perpendicularly to an external surface of said molded part. The shaft is provided at its bottom end with at least one projection and at its top with a head for attachment thereto of a lifting means. The projection on said shaft extends in the radial direction of said shaft and is displaceable into a cross sectional enlargement in the side wall of the hole in said molded part. The cross sectional enlargement corresponds in shape to said projection and forms an undercut face in said hole. A key is likewise insertable into said hole from the end of said hole remote from said cross sectional enlargement to force said projection into said cross sectional enlargement. The key together with the shaft completely fill said hole in the region of said cross sectional enlargement.

**3,652,119**

## TELESCOPING CAMPER CABIN FOR TRUCKS

**Robert D. Hall, 10320 Sunland Blvd., Sunland, Calif.**

**Filed May 26, 1970, Ser. No. 40,604**
**Int. Cl. B60p** *3/34*
**U.S. Cl. 296—23 C** **7 Claims**

A vertically telescoping glass fiber-reinforced plastic camper cabin embodying a one-piece lower body section with unitary plastic cabinet sections mounted therein, together with a double-shell upper body section of glass fiber-reinforced plastic and metal inner frame construction telescopically receiving the lower body section, and fluid rams for raising and lowering the upper section connected between brackets provided in the sections.

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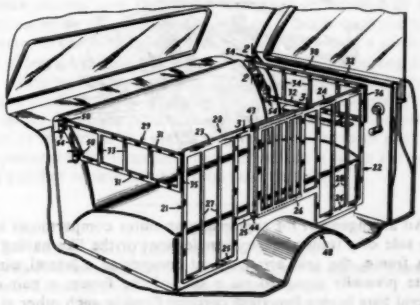
**3,652,120**

## CHILD RESTRAINING GATE FOR AUTOMOBILES

**Jeffrey M. Bernbach, 300 Central Ave., Hartsdale, N.Y.**

**Filed Mar. 23, 1970, Ser. No. 21,780**
**Int. Cl. B60r** *21/02*
**U.S. Cl. 296—24** **7 Claims**



A child-restraining gate adapted to fit along the front edge of the rear seat of an automobile to form the front side of a crib-like enclosure, the gate being adjustable in size to accommodate automobiles having different interior widths.

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**3,652,121**

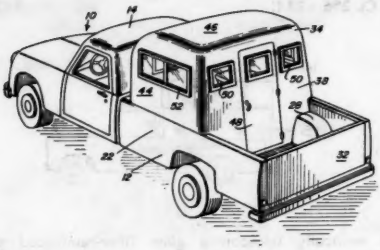
## PICKUP TRUCK BOX MOUNTED CAB

**Erik V. Hjelm, Box 42, Westby, Mont.**

**Filed July 24, 1970, Ser. No. 58,084**
**Int. Cl. B62d** *33/00*
**U.S. Cl. 296—26** **8 Claims**

An enclosure for mounting in the forward end of the load bed of a pickup truck. The enclosures includes front, rear and opposite side walls and the rear corners of the enclosure include rearwardly, downwardly and outwardly opening opposite side recesses for receiving those portions of the rear wheel wells of the associated pickup truck which project inwardly of the side walls of the load bed. The front wall of the enclosure includes an openable window assembly for close registry with the rear window of the cab of the associated pickup truck and the length of the enclosure is such that it

will, when disposed in a pickup truck load bed, occupy only the front half of the pickup truck load bed, thereby leaving



the rear portion of the pickup truck load bed free to receive various loads therein.

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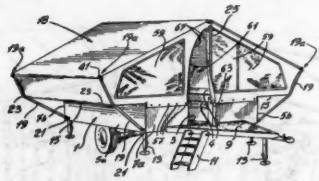
**3,652,122**
**COMPARTMENT FOR TRAILER**

**Paul E. Beauregard, 379 West, 9th St., Thetford Mines Co., Megantic, Quebec, Canada**

**Filed Dec. 3, 1969, Ser. No. 881,725**
**Claims priority, application France, Dec. 5, 1968, 036983**
**Int. Cl. B60p *3/34***
**U.S. Cl. 296—23** **17 Claims**



An arrangement for supporting an outer compartment on the side of a trailer-house, a trailer-tent or the like having a box frame, the said arrangement comprising a lateral wing plate pivotally mounted on a side of the frame, a pair of lateral bars having two rigid portions fixed to each other at a predetermined angle, the first portion for holding the wing plate in a horizontal position is removably fixed to the outer edge of the wing plate and pivotally fixed through the frame, the second portion of the lateral bars extends from the first portion at the outer edge of the wing plate and above the latter, a crossbar removably connects the upper ends of the two lateral bars, a piece of flexible material extends over the crossbar and is held at one of its end to the said outer edge of the wing plate and the other end is held to a part of the frame above the wing plate. The space between the piece of flexible material and the wing plate constitute a side compartment for a tent or a trailer.

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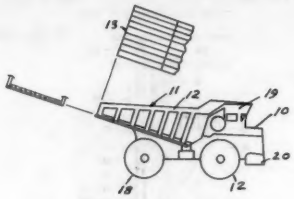
**3,652,123**
**VEHICLE BED LINER**

**James R. Speers, Erie, Pa., assignor to Continental Rubber Works, Erie, Pa.**

**Filed Jan. 8, 1970, Ser. No. 1,363**
**Int. Cl. B62h *33/04***
**U.S. Cl. 296—28 D** **3 Claims**

This specification discloses a truck bed liner made of planks of rubber bonded to metal plates. The planks may be, for example, 12 inches wide and two inches thick, and run the length of the bed. Threaded bolts extend through the



metal plates by which the planks may be attached to the floor of the truck bed.

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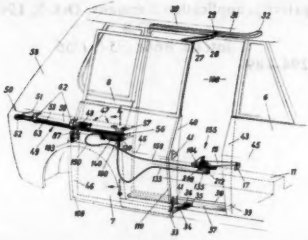
**3,652,124**
**ACTUATING MECHANISM FOR A DOOR OF A VEHICLE, IN PARTICULAR A TAXI**

**Pier Giorgio Tronville, Heilbronn, Germany, assignor to Deutsche Fiat Aktiengesellschaft, Heilbronn, Germany**

**Filed Oct. 3, 1969, Ser. No. 863,523**
**Claims priority, application Germany, Oct. 3, 1968, P 18 00 784.6**
**Int. Cl. B60j *5/06***
**U.S. Cl. 296—146** **32 Claims**



In a small automobile, in particular a small taxi, a sliding door on the side opposite the driver is actuated by a hand lever and motor control convenient to the driver. A hand lever controls the latching and unlatching of the door and its movement into and out of the door opening. After the door has moved out of the opening it is moved rearwardly on tracks by a motor controlled by a control member near the hand lever.

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**3,652,125**
**RECLINING CHAIR**

**Walter C. Rogers, Jr., High Point, N.C., assignor to Royal Development Company, Inc., High Point, N.C.**

**Filed Mar. 10, 1970, Ser. No. 18,151**
**Int. Cl. A47c *1/02***
**U.S. Cl. 297—61** **18 Claims**

The invention discloses a low profile reclining chair having a primary and secondary backrests. The secondary backrest

is positioned at the rear of the chair when the chair is in the upright position and is movable from such position to an operative position above the primary backrest upon reclining movement of the chair. Movement of the secondary backrest begins shortly after reclining movement of the chair begins, and is then continuous during substantially the entire reclining cycle of the chair.

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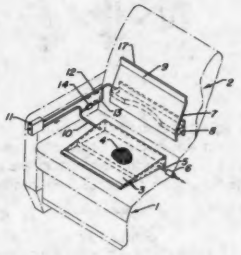
**3,652,126**
**PNEUMATIC ADJUSTMENT SYSTEM FOR SEAT BACK PANEL**

**Norman D. Folling, Litchfield, Conn., assignor to Universal Oil Products Company, Des Plaines, Ill.**

**Filed Aug. 31, 1970, Ser. No. 68,095**
**Int. Cl. A47c 7/14**
**U.S. Cl. 297—284** **7 Claims**



A pneumatic system for adjusting the thickness or projection of a portion of a seat back, as for example the lumbar section of the back of a seating unit. A self-fillable air reservoir is provided by a foam-filled airtight envelope that will be positioned under the seat portion of the seating unit and this envelope is connected through conduit means and associated valving means to a small volume adjustable bladder portion in the seat back. A special conduit and valving arrangement may also be provided to have the air withdrawn from the seat back bladder portion into the air reservoir envelope so as to deflate the back support portion where there is no seat occupant.

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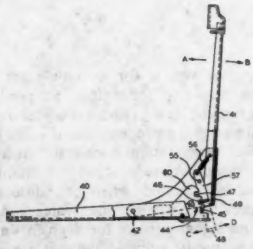
**3,652,127**
**COUNTERBALANCED FOLDING SEATS WITH POSITION LOCK**

**Paul Freedman; Gerald Freedman; Robert A. Wahls, and Harvey R. Hornstein, all of Evanston, Ill., assignors to Freedman Seating Company, Evanston, Ill.**

**Filed May 18, 1970, Ser. No. 38,177**
**Int. Cl. A47c 1/026**
**U.S. Cl. 297—372** **4 Claims**



The back frame of a folding auto seat has a generally "L-shaped" configuration in vertical cross section. The back frame is pivotally attached to the bottom frame at a pivot point in the toe of the "L-shape." A pair of stop plates on opposite sides of the bottom frame engage a bail-like latch member which is normally spring biased to engage any latch stop on the plate. When the bail-latch is pulled against the spring bias and out of the latch stop, the back may be moved to a desired position. Then, the bail is released, and the spring bias pulls the latch into a latch stop to fix the desired position.

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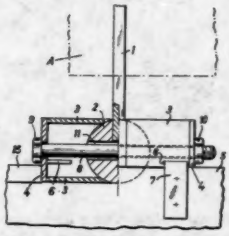
**3,652,128**
**HEAD AND NECK REST**

**Bernhard Schwarz, Eichenstrasse 11, Muri, Berne, Switzerland**

**Filed Jan. 20, 1970, Ser. No. 4,346**
**Claims priority, application Switzerland, Jan. 23, 1969, 1155/69**
**Int. Cl. A47c 7/36**
**U.S. Cl. 297—408** **4 Claims**



A head and neck rest for vehicle seats comprises a head piece secured to a supporting rod which is mounted by the intermediary of an articulated joint on a saddle or supporting frame on the back rest of a seat. The joint allows a pivoting or tilting movement of the head piece and its supporting rod. A clamping rod traverses the joint and is arranged for exerting a predetermined clamping force on the members of the joint for controlling the tilting movement of the head piece due to the action of a shock received by the head or neck of a passenger, for example when the vehicle is hit in the rear by another vehicle driving in the same direction.

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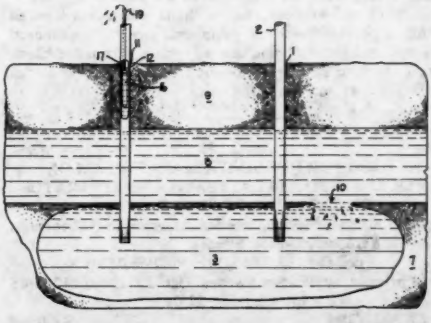
**3,652,129**
**SOLUTION MINING METHOD**

**Byron P. Edmonds, Denver, Colo., assignor to Kalium Chemicals Limited, Regina, Saskatchewan, Canada**

**Filed Aug. 11, 1970, Ser. No. 62,849**
**Int. Cl. E21b 43/28**
**U.S. Cl. 299—4** **16 Claims**



A method of operating a solution mining cavity which has come into open contact or communication with an underground, watermbearing formation is described in which

flow into and out of the cavity is controlled generally to provide a feed to the cavity slightly in excess of the fluid withdrawn from the cavity. Control is established by introducing solvent into and removing product solution from the cavity at a controlled rate to insure that the quantity of fluid fed into the cavity is in excess of the quantity of fluid removed from the cavity. The invention is described particularly with respect to the solution mining of KC1.

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**3,652,130**

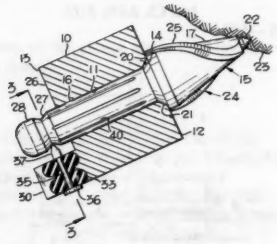
## BIT AND BLOCK ASSEMBLY

**Gerald W. Elders, 10 Hillcrest, Christopher, Ill.**

**Continuation-in-part of application Ser. No. 498,639, Oct. 20, 1965. This application Mar. 2, 1970, Ser. No. 15,768**

**Int. Cl. E21c *35/18***

**U.S. Cl. 299—86** **11 Claims**



A bit and block assembly in which the bit includes an elongate shank that is rotatively mounted in a block bore extending through the block, the bit shank being provided with an end extending through and beyond the mounting bore and laterally clear of the block. A bit head includes means adapted to strike a wall to turn the bit upon picking of the wall by the head. A locking means is carried by a lateral block portion that is spaced from the shank end, the locking means engaging the shank end to preclude unintentional withdrawal of the shank from the bore, yet enable turning of the shank, the lateral block portion protecting the locking means while the lateral space peripherally about the shank end enables cuttings to move through the bore and out of the block and to fall free axially of the shank end.

In one embodiment, the block is provided with an open end counterbore larger than and communicating with the said bore. The shank end, including a peripheral groove adapted to receive a locking element, extends into the counterbore, such counterbore providing the peripheral lateral space about the shank end and groove. The shank can be provided with a plurality of circumferentially spaced, longitudinal grooves extending from substantially the head to the shank end outside of the mounting bore for the passage of material axially along the shank out of the block.

In another embodiment, the bit shank includes a tapered end that is provided with the peripheral groove, the tapered shank end and groove being laterally spaced from the block defining the bore to provide for the free passage of material through the bore and out of the block.

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**3,652,131**

## METHOD FOR DIVIDING A MAIN STREAM OF PARTICLES INTO PART STREAMS AND APPARATUS FOR CARRYING OUT THE METHOD

**Bengt J. Carlsson, Motala, Sweden, assignor to Aktiebolaget Mantala Verkstad, Motala, Sweden**

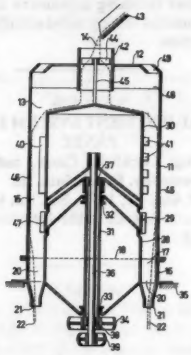
**Filed Oct. 13, 1969, Ser. No. 865,759**

**Claims priority, application Sweden, Oct. 22, 1968, 14265/68**

**Int. Cl. B65g *53/04***

**U.S. Cl. 302—28** **9 Claims**

A method and apparatus for transforming a constant main stream of particles into a particle web having a uniform mass particle distribution which varies in a desired manner transversely of the web by directing the main stream into an annular chamber against a rotating member concentric within the



chamber. The rotating member distributes the main stream about the chamber and the particles pass out through a plurality of outlets opening along a plane in the chamber which is normal to the longitudinal axis of the chamber.

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**3,652,132**

## ANTISKID CONTROL SYSTEM

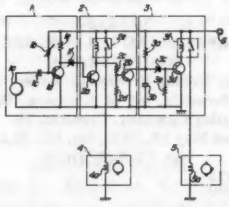
**Noriyoshi Ando, Kariya-shi; Atutoshi Okamoto, Toyohashi-shi; Koichi Taniguchi, Kariya-shi; Yoshiaki Nakano, Gifu-shi, and Koichi Tokyama, Toyohashi-shi, all of Japan, assignors to Nippon Denso Kabushiki Kaisha, Kariya-shi, Japan**

**Filed Aug. 28, 1969, Ser. No. 853,745**

**Claims priority, application Japan, Sept. 6, 1968, 43/64540**

**Int. Cl. B60t *8/12***

**U.S. Cl. 303—21 CG** **4 Claims**

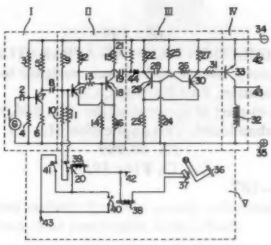


An antiskid control system for a vehicle including apparatus for automatically changing a predetermined threshold detection value in a peripheral wheel deceleration detecting apparatus so that a predetermined value for detecting excessive wheel deceleration is changed in accordance with the vehicle deceleration. A brake constant pressure holding apparatus is actuated when the detected wheel deceleration exceeds the predetermined value and if the excessive deceleration signal persists for a given time span, a brake release apparatus is actuated thereby preventing unnecessary brake releases that could be caused by noise signals.

## 3,652,133
## BRAKE CONTROL DEVICE

Toshio Yamazaki; Takao Abu; Takefumi Sato, all of Osaka-shi; Koji Nishida, and Tosiaki Okamoto, both of Kariya-shi, all of Japan, assignors to Hayakawa Denki Kogyo Kabushiki Kaisha, Osaka-shi and Aisin Seiki Kabushiki Kaisha, Kariya-shi, Japan

Filed June 3, 1969, Ser. No. 829,948
Claims priority, application Japan, June 5, 1968, Sept. 11, 1968; 43/38547, 43/65352
Int. Cl. B60t 8/12
U.S. Cl. 303—21 CG 7 Claims

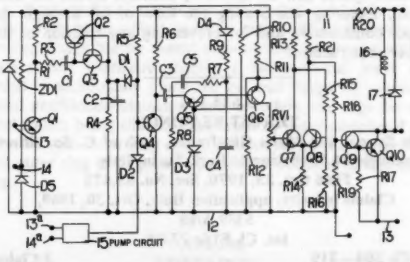


An improved brake control device in a brake system of the type in which decrease in the speed of wheels due to braking force applied to them is converted into an electrical signal which activates brake release means when its value exceeds a preset reference value and is detected thereby to remove the braking force for a suitable time, after which the braking force is again applied, the braking of the wheels being accomplished by a cyclic repetition of this braking and releasing action, the brake control device having means for lowering the reference value after receiving the electrical signal corresponding to the initial speed decrease of the wheels thereby to cause the system to operate thereafter on the basis of the reference value thus lowered.

## 3,652,134
## ANTI-SKID CONTROL SYSTEM UTILIZING A PUMP CIRCUIT FOR PRODUCING A VOLTAGE DEPENDENT ON FREQUENCY

Leonard Remsay Hiscox, Birmingham, England, assignor to Girling Limited, Tyseley, Birmingham, England

Filed Mar. 18, 1970, Ser. No. 20,786
Claims priority, application Great Britain, Mar. 31, 1969, 16,673/69
Int. Cl. B60t 8/12
U.S. Cl. 303—21 CG 2 Claims

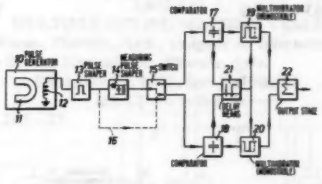



An antiskid control system utilizing a pump circuit for producing a voltage dependent on the frequency of an AC input has a first capacitor across which the output voltage of the circuit is developed and a second capacitor connected to the input terminals of the circuit. Usually in arrangements of this kind the first capacitor receives one pulse for each cycle of the input, but in accordance with the invention two transistors are arranged coupling the capacitors so that the first capacitor receives two charging pulses per cycle.

## 3,652,135
## METHOD AND ARRANGEMENT FOR PREVENTING THE LOCKING OF WHEELS OF A COMMERCIAL VEHICLE

Gunther Baumann, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 21, 1969, Ser. No. 878,685
Claims priority, application Germany, Nov. 26, 1968, P 18 10 950.7
Int. Cl. B60t 8/08
U.S. Cl. 303—21 CF 16 Claims

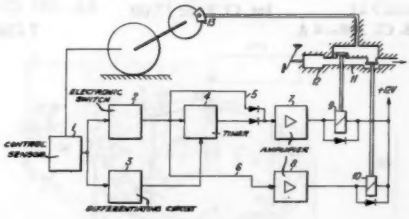


Pulses generated in synchronism with the rotation of the wheel are reshaped into measuring pulses having a steep leading edge and a slowly decreasing trailing edge. The pulses overlap. The instantaneous value of a measuring pulse at the beginning of a subsequent measuring pulse is compared with the corresponding value of a preceding measuring pulse, and a terminating signal terminating the application of the brakes, is furnished when the difference between two sequential so-determined instantaneous values exceed a predetermined difference.

## 3,652,136
## ANTISKID BRAKE SYSTEM FOR VEHICLES

Erwin Schlitz, Heusenstamm; Werner Fink, Frankfurt am Main, and Gunther Werner, Oberstedten, all of Germany, assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 12, 1970, Ser. No. 2,143
Claims priority, application Germany, Jan. 14, 1969, P 19 01 476.7
Int. Cl. B60t 8/12
U.S. Cl. 303—21 BE 6 Claims




A vehicle antiskid brake system in which the brake pressure is reduced at one or more wheel deceleration thresholds and the brake pressure is increased when the maximum wheel acceleration is reached. Thus the brakes are reapplied before the wheel has reached the vehicle speed and at a time when the brake force coefficient is greatest. An electronic circuit closes an inlet valve and opens an outlet valve in the brake line to the wheel when the deceleration threshold is

reached. Although the outlet valve is closed when the wheel deceleration is reduced to a point above the threshold, a timing circuit keeps the inlet valve closed until a differentiating circuit generates a signal indicating that the acceleration of the wheel has reached a maximum value, whereupon the inlet valve is opened to complete the cycle.

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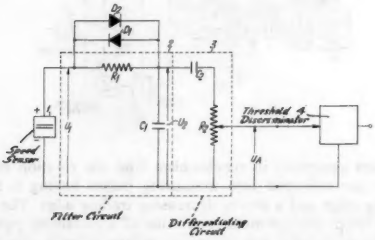
**3,652,137**

## ANTISKID CONTROL CIRCUIT

**Werner Fink, Frankfurt am Main; Erwin Schlitz, Heusenstamm, and Gunther Werner, Oberstedten, all of Germany, assignors to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Feb. 25, 1970, Ser. No. 14,110**
**Claims priority, application Germany, Mar. 1, 1969, P 19 10 599.8**
**Int. Cl. B60t *8/12***
**U.S. Cl. 303—21 CG** **7 Claims**




In this antiskid control of the type ih which a DC signal proportional to wheel speed is filtered and differentiated in an RC-circuit to obtain an acceleration signal free of undesirable harmonics, diodes or other semi-conductors having a fixed forward voltage are connected in opposite forward direction in parallel to the resistance of the filter so that an acceleration signal bypasses the resistance and is conducted to the discriminator without significant time delay when the forward voltage of the diodes is exceeded.

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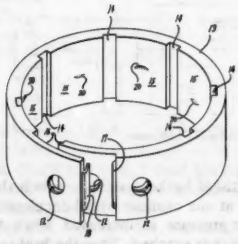
**3,652,138**

## SELF-LOCKING SNAP-ON COLLAR FOR OIL WELL OPERATIONS

**Charles H. Collett, P.O. Box 411, Menlo Park, Calif.**

**Continuation-in-part of application Ser. No. 872,229, Oct. 29, 1969, now abandoned. This application Apr. 23, 1970, Ser. No. 31,279**
**Int. Cl. F16c *17/00***
**U.S. Cl. 308—4 A** **7 Claims**



A thrust or stop-collar principally adapted for use on oil well drill pipes, sucker rods, guides, and similar equipment, combines a base of elastomeric or similar material with a novel spring insert. Configuration of the collar plus the effect of the specially constructed insert combine to give a very great bond between the shaft and the collar while permitting ready and economical installation and removal. An alternate embodiment provides a removable gripping ring inserted concentrically around the inner surface of the collar and disposed by geometry and construction to exert additional bond between the shaft and collar as further insurance against slipping while retaining the ease of installation and removal.

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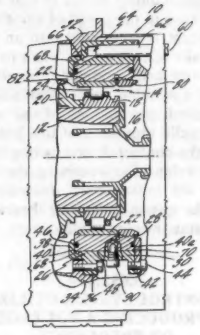
**3,652,139**

## VIBRATION DAMPING APPARATUS

**James P. Memery, Manchester, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.**

**Continuation-in-part of application Ser. No. 886,923, Dec. 22, 1969, now abandoned. This application May 27, 1970, Ser. No. 40,989**
**Int. Cl. F16c *39/04***
**U.S. Cl. 308—187** **10 Claims**



A bearing and support assembly for a rotating shaft, such as a gas turbine engine rotor utilizes a damper construction employing a hydrodynamic film of oil in a relatively large clearance space, and the assembly includes means for controlling, metering and sealing the flow of oil through the damper construction and for preventing any rotation of the damper construction.

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**3,652,140**

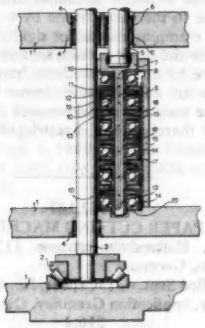
## THRUST BEARINGS

**Maris Bruno, and Maris Gianfranco, both of C. So Vittoria Emanuele 74 Michelangelo Bovi, Turin, Italy**

**Filed Oct. 23, 1970, Ser. No. 83,471**
**Claims priority, application Italy, Oct. 30, 1969, 5389 A/69**
**Int. Cl. F16c *27/08***
**U.S. Cl. 308—219** **3 Claims**

Device for supporting a shaft rotating with axial thrust jointly with another shaft alongside and parallel, the first shaft being longer than the second, characterized by the fact that the said second shaft is supported by two pluralities of thrust bearings inserted between the collars of two series of bushes, said bushes being supplied with radial collars, one

inner series being mounted radially firm but axially solidable on said second shaft and the other series of external bushes



being mounted radially firm and axially solidable mounted on a cylinder fixed to or removable from a body.

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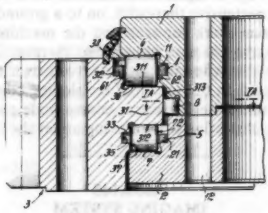
**3,652,141**
**COMBINED THREE-SECTIONAL AXIAL-RADIAL ROLLER TURNING CONNECTION**

**Werner Husten, Hellinghausen, and Heinrich Siemensmeyer, Dortmund-Brunninghausen, both of Germany, assignors to Hoesch Aktiengesellschaft, Dortmund, Germany**

**Filed Nov. 27, 1970, Ser. No. 93,219**
**Claims priority, application Germany, Nov. 28, 1969, P 19 59 710.5**
**Int. Cl. F16c *19/14***
**U.S. Cl. 308—174** **5 Claims**



A three-sectional combined axial-radial antifriction journaling system, in which an outer ring with an inwardly extending flange has by means of antifriction elements such as axial rollers journaled therein a two-sectional inner ring which is additionally journaled on said flange by means of radial antifriction elements such as rollers, the cage for said axial rollers being slidably supported by inner peripheral surfaces of said outer ring and by outer peripheral surfaces of said outer ring and by outer peripheral surfaces of said inner ring.

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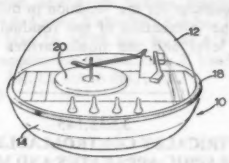
**3,652,142**
**CONTAINER**

**Charles E. Kreutzweiser, Waterloo, Ontario, Canada, assignor to Electrohome Limited, Kitchener, Ontario, Canada**

**Filed Sept. 22, 1970, Ser. No. 74,263**
**Int. Cl. A47b *81/06***
**U.S. Cl. 312—8** **19 Claims**

A combination of a container and a lid in which the container and lid have no physical interconnection. The lid is



movable between a closed position an open position in which the lid may be maintained.

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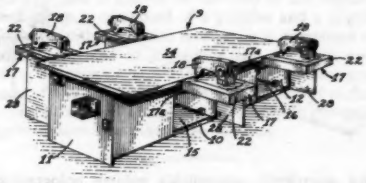
**3,652,143**
**MULTIPLE SEWING MACHINE TABLE**

**Harry Wener, Phoenix, Ariz., assignor to International Education Sewing Manual, Inc., Phoenix, Ariz.**

**Filed July 27, 1970, Ser. No. 58,307**
**Int. Cl. A47b *81/00***
**U.S. Cl. 312—27** **3 Claims**



A sewing machine table employing an overhanging top arranged to support a series of sewing machines outside the periphery of the top in easily accessible position while leaving the table top completely unobstructed for laying out work and providing drophead supports for the individual machines so that they may be lowered and laterally moved into the support to concealed positions under the table top when not in use.

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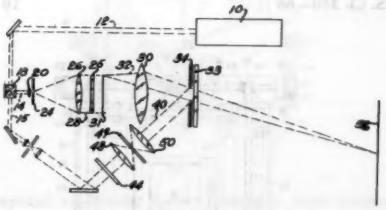
**3,652,144**
**AMPLITUDE WEIGHTING IN HOLOGRAPHY**

**Anthony Vander Lugt, Saline, Mich., assignor to Radiation Incorporated, Palm Bay, Fla.**

**Filed Sept. 9, 1970, Ser. No. 70,856**
**Int. Cl. G02b *27/22***
**U.S. Cl. 350—3.5** **12 Claims**



Holographic system in which the signal (object) beam, the reference beam, or the readout beam is weighted (i.e., shaped) in amplitude as a function of the spatial coordinates of the hologram plane. Either the reference beam or the signal beam may be weighted in accordance with the light distribution of the signal beam to provide smaller variation in

modulation, or unity modulation, for the various spatial frequencies in the signal beam over the entire area of the hologram. The readout beam may be shaped or weighted to further compensate for the variation in diffraction efficiency caused by the interaction of the residual variations in the modulation level and the nonlinearities of the recording medium.

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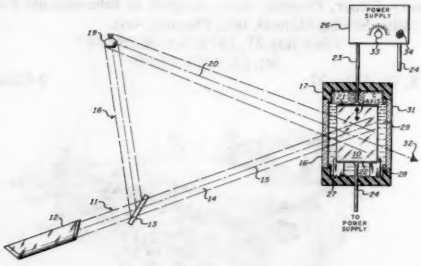
**3,652,145**

## ELECTRICALLY CONTROLLABLE VOLUME HOLOGRAPHIC APPARATUS AND METHOD FOR OPERATING SAID APPARATUS

**James B. Thaxter, Townsend, Mass., assignor to Sperry Rand Corporation**

**Filed June 30, 1969, Ser. No. 837,665**
**Int. Cl. G02b** *27/00*
**U.S. Cl. 350—3.5** **14 Claims**




An electrically controllable volume holographic storage apparatus comprising a ferroelectric crystalline member having electrodes affixed thereto for establishing an electric field in the member, the electric field being operative in the process of constructing the hologram both to increase the sensitivity of the crystal to light beams incident thereon and to optimize the efficiency of the holographic grating, and further operative, in the process of reconstructing the image, for controllably adjusting the intensity of said image.

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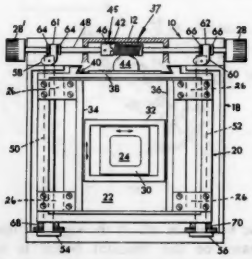
**3,652,146**

## PRECISION MICROSCOPE STAGE

**David Sydney George, Cambridge, England, assignor to Image Analysing Computers Limited, Melbourn, Royston, England**

**Filed Oct. 27, 1970, Ser. No. 84,366**
**Claims priority, application Great Britain, Oct. 31, 1969, 53,406/69**
**Int. Cl. G02b** *21/26*
**U.S. Cl. 350—86** **10 Claims**



The present invention provides a precision stage assembly for an optical microscope which comprises an outer frame adapted to be rigidly mounted on the main structure of an optical microscope, an inner frame for carrying an X and Y traverse device on which a specimen may be carried, an intermediate frame between the inner and outer frames adjustable relative to the outer frame by a coarse focus drive, and releasable clamping means for rigidly clamping together the intermediate and outer frames, said inner frame being adjustable relative to the intermediate frame by a fine focus control mechanism and the inner frame being located with reference to the intermediate frame such that significant relative movement therebetween is restricted to movement in a vertical direction.

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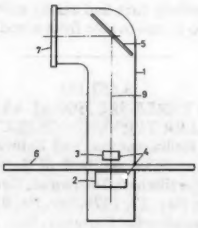
**3,652,147**

## PAPER CUTTING MACHINES

**Rudolf Mohr, Hattersheimerstrasse 117-118, 6238 Hofheim, Taunus, Germany**

**Filed Sept. 4, 1970, Ser. No. 69,618**
**Claims priority, application Germany, Oct. 31, 1969, P 19 54 816.4**
**Int. Cl. G02b** *27/18, 27/32*
**U.S. Cl. 350—113** **4 Claims**



The guiltotine saddle of a paper cutting machine is equipped with an optical viewing system projecting an image of the relevant portion of the machine table fine scale and of a contrast wedge alongside the machine table scale and having a taper coextensive therewith, on to a ground glass screen having a datum mark for scanning the machine table scale and a transverse coarse scale scribed thereon. The arrangement is such that when the saddle travels over the table, the image projected on the screen of the sloping edge of the contrast wedge scans the transverse coarse scale pari passu with the scanning of the fine scale moving under the datum mark.

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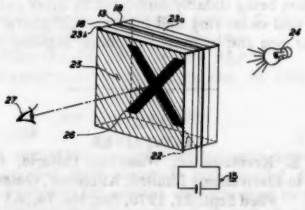
**3,652,148**

## IMAGING SYSTEM

**Joseph J. Wysocki; James E. Adams, both of Webster; James H. Becker, Pennfield; Robert W. Madrid, Macedon, and Werner E. L. Haas, Webster, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.**

**Filed May 5, 1969, Ser. No. 821,565**
**Int. Cl. G02f** *1/26, 1/28*
**U.S. Cl. 350—150** **29 Claims**



A system transforming an optically negative liquid crystalline substance to an optically positive liquid crystalline

mesophase by an applied electrical field, and an imaging system wherein the electrical field-induced transition images a liquid crystalline member.

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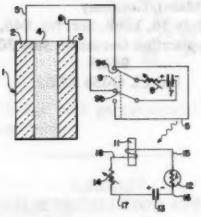
3,652,149

## VARIABLE LIGHT-FILTERING DEVICE WITH A REDOX COMPOUND WHICH FUNCTIONS AS ITS OWN ELECTROLYTE

Howard G. Rogers, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 2, 1969, Ser. No. 854,522
Int. Cl. G02f 1/28, 1/36; G02b 5/30
U.S. Cl. 350—160 R 23 Claims



This invention relates to light filters employing redox compounds that are substantially light-transmitting in their oxidized state and capable of forming a stable colored free radical upon the addition of electrons. The colored free radical formed in response to the flow of electric current renders the device light-absorbing. To restore the original light-transmitting properties, the colored free radical may be readily reoxidized, for example, by reversing the direction of current flow.

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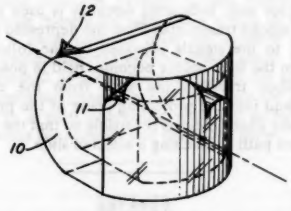
3,652,150

## TRANSPARENT MEMBRANES FOR GAS LENSES AND LIGHT GUIDANCE SYSTEM EMPLOYING SAME

Dwight W. Berreman, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 1, 1968, Ser. No. 741,449
Int. Cl. G02b 1/06
U.S. Cl. 350—179 18 Claims



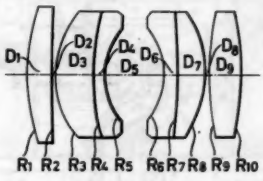

Optical elements are formed of static gases of various refractive indices separated by optically thin transparent membranes, such as collodion or aluminum oxide films. Lenses are described having flat, approximately cylindrical and approximately spherical surfaces, and formulas are provided which are useful for the designing of a light guidance system using these lenses.

3,652,151

## PHOTOGRAPHIC LENSES PRIMARILY UTILIZING LIGHT OF SHORTER WAVELENGTHS

Tadasi Kawabe, Ako, and Akira Tajima, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1970, Ser. No. 40,619
Claims priority, application Japan, June 2, 1969, 44/42529
Int. Cl. G02b 9/42, 1/02
U.S. Cl. 350—222 2 Claims




The disclosed photographic lens assembly passes light of shorter wavelengths, one lens made of magnesium oxide crystal which forms positive lens in the lens assembly. A first lens group in the assembly is composed of a positive meniscus lens which is convex on the side of the object. A second lens group is composed of a positive and a negative lens cemented together. A third lens group is composed of a negative lens cemented to a positive lens with the group overall being concave toward an object. A fourth lens group is composed of a double convex lens. The cemented surfaces of the second group and of the third group have curvatures whose algebraic sum is less than a given value.

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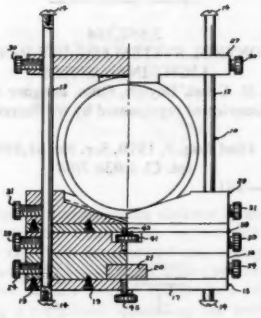
3,652,152

## ADJUSTABLE OPTICAL EQUIPMENT HOLDER

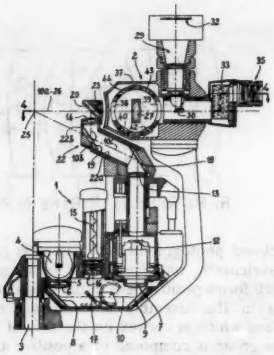
William R. Thursby, Jr., San Antonio, Tex., assignor to The United States of America as represented by the Secretary of the Air Force

Filed July 10, 1970, Ser. No. 53,725
Int. Cl. G02b 7/02
U.S. Cl. 350—252 2 Claims



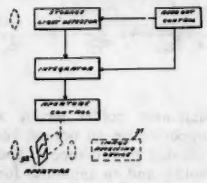
An optical equipment holder having a base member, adapted to be supported on an optical bench carrier. The base member is secured to two support rods which hold an optical element holder and an apparatus for adjustably positioning the optical element in the vertical direction. The optical element holder is capable of holding various types of optical elements. The support rods are removable from the base member so that the optical elements can be moved out of the optical path.

3,652,153
**SLIT OR SPOT LAMP STEREOMICROSCOPE**
Paul Frederic Marie Gambs, Lyon, France, assignor to Societe Anonyme dite: Gambs S.A., Lyon, France
Filed Apr. 17, 1970, Ser. No. 29,608
Int. Cl. A61b 3/10
U.S. Cl. 351—14 4 Claims



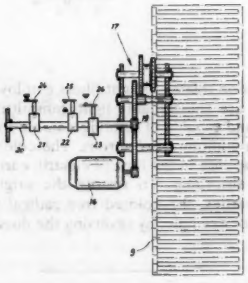
A slit or spot lamp microscope of the kind including a slit or spot lamp and a stereomicroscope, both pivotally mounted on a common vertical axis, characterized in that the end portion of the optical system of the lamp comprises essentially two reflectors, which impart a double-bent path to the optical beam casting the slit or spot image onto an object to be examined, so that the beam portion issuing from the reflector positioned last in the said path, that is, the last beam portion, cooperates with the beam portion entering the reflector positioned first in the said path, that is, the antepenultimate beam portion, to determine the point where the cast image of the slit or spot is formed, while a part of the optical system including at least said two reflectors is adapted to swivel about the axis of said antepenultimate beam portion.

3,652,154
**LIGHT CONTROL SYSTEM FOR USE IN VERY LOW LIGHT INTENSITIES**
Radames K. H. Gebel, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force
Filed Aug. 7, 1970, Ser. No. 61,890
Int. Cl. G03b 7/08
U.S. Cl. 352—141 8 Claims



A high sensitivity light control system for providing relatively constant effective values of light intensity to photographic devices operating in very low levels of light intensity is provided by using the signal derived by integrating, amplifying, and smoothing the output of a periodically readout storage light detector tube to control a mechanical aperture, scanning frame time, or light gain in a variable gain image intensifier stage. Light intensities from the scene photographically viewed are detected and integrated temporally in the storage light detector tube, integrating the output of the storage light detector provides spatial integration of the temporally integrated light intensity over the scene viewed.

3,652,155
**SLIDE PROJECTOR WITH CONTROLLED SLIDE CHANGER AND SEPARATE HOLDER**
Josef Scheibel, Ober-Morlen, Germany, assignor to Braun AG, Frankfurt (Main), Germany
Filed July 30, 1969, Ser. No. 846,127
Claims priority, application Germany, July 30, 1968, P 17 72 984.9
Int. Cl. G03b 23/02
U.S. Cl. 353—25 15 Claims

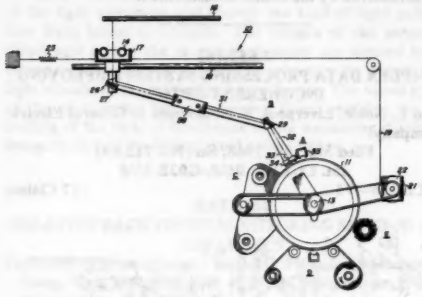


A system for projecting slides in which the slide to be projected is selected from an input such as depressed key switches. A slide holder subdivided into individual compartments each retaining a slide, is then moved into position so that the selected slide is accessible for projection. A followup switch coupled from the viewpoint of motion, to the slide holder, provides signals of the position of the holder and thereby the location of the individual slides with respect to the projector unit. Indicating circuitry is used to determine when the signals transmitted from the depressed key switches are equal to the signals provided by the followup switch, whereupon the slide holder becomes held in position. A slide changer then transfers the slide from the compartment selected, and into the projecting plane of the projector. The drive for the slide holder is reversible so that the holder takes the shortest path in reaching a selected slide.

3,652,156
**LINEAR-TO-DRUM OPTICAL SCAN CONVERTER SYSTEM**
Roy J. Lahr, Westport, Conn., and James R. Cassano, Penfield, N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Filed Jan. 13, 1970, Ser. No. 2,600
Int. Cl. G03g 15/04
U.S. Cl. 355—8 3 Claims

Optical imaging apparatus for scanning an object supported on a flat platen and projecting the scanned image onto a photosensitive structure in the form of a cylindrical

drum. The apparatus is characterized by maintaining constant the conjugate length of the optical path, as well as



maintaining the image path perpendicular to the flat platen and the cylindrical drum.

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**3,652,157**

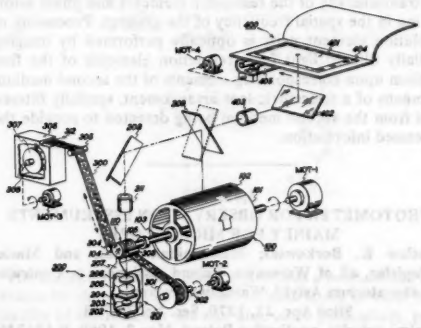
**MICROFILM PROJECTION APPARATUS**

**John E. Blackert, and Harvey S. Towers, both of Webster, N.Y., assignors to Xerox Corporation, Rochester, N.Y.**

**Filed Aug. 13, 1969, Ser. No. 849,674**

**Int. Cl. G03l** *27/46*

**U.S. Cl. 355—49** **1 Claim**



A transparent rotatable cylinder having spaced support flanges and seats therein for supporting a strip of microfilm and the like a small distance from the cylinder while the microfilm is being projected onto an image plane. A projector lamp is located adjacent the cylinder on the side of the cylinder opposite the image plane to illuminate the microfilm as it is fed in a path concentric with the surface of the cylinder between the cylinder and the image plane.

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**3,652,158**

**EXPOSURE DEVICE FOR FLEXIBLE MATERIALS**

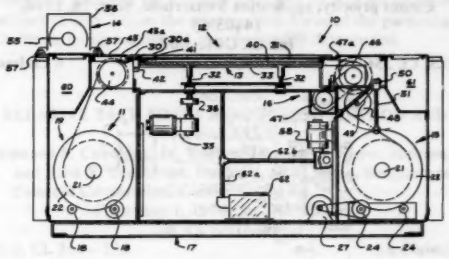
**Dennis A. Burgess, Minneapolis, Minn., assignor to Colight Inc., Minneapolis, Minn.**

**Filed Apr. 9, 1970, Ser. No. 27,086**

**Int. Cl. G03b** *27/20*

**U.S. Cl. 355—91** **4 Claims**

A device for exposing flexible, continuous materials including a supply source, means for feeding the material across an exposure area, means for collecting the exposed material and means for exposing the material as the same is held in the exposure area. The exposure area includes means for automatically bringing the material into registration and contact with the negative or pattern member and thereafter actuating the exposure light to properly expose the material and thereafter releasing the material subject to advancement



into a new exposure area. The unit further contemplates selective advancement over predetermined increments of length and predetermined selection of quantity of such exposures.

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**3,652,159**

**RANGEFINDER FOR MEASURING THE DISTANCE OF AN OBJECT HAVING A LUMINOUS SPOT**

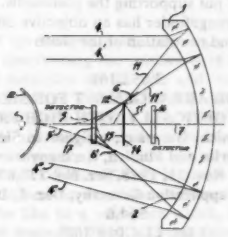
**Christian Lietar, Yverdon Vaud, Switzerland, assignor to Paillard S.A., Sainte-Croix, Vaud, Switzerland**

**Filed Sept. 15, 1969, Ser. No. 857,813**

**Claims priority, application Switzerland, Sept. 27, 1968, 14586/68**

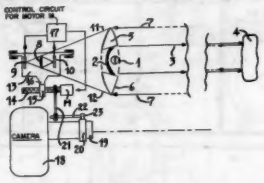
**Int. Cl. G01c** *3/08*

**U.S. Cl. 356—4** **8 Claims**



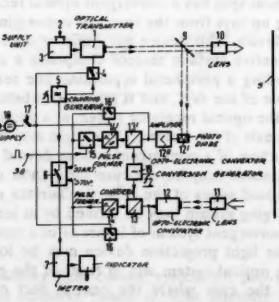
A rangefinder for measuring the distance of an object having a luminous spot has a convergent optical receiving system for picking up rays from the spot and converging them on to a sensing device. This device has a mirror wherein the edges of the reflective surface thereof comprises a separator element including a peripheral separating line sensitive to the convergence of the rays, and is arranged substantially on the caustic of the optical receiving system at a point remote from the optical axis of the system. The system may be at least one annular portion of a convergent system devoid of its central part. The caustic may have a cusp for greater concentration of light on said edges of the reflective surface of the mirror. The converging system may be formed by at least a part of a ring of a convergent system of lenses or of a concave Mangin mirror. The light projection device may be located on the axis of the optical system and in front of the photosensitive device, in the case where the central part of the optical system is not used.

3,652,160
LIGHT BEAM RANGEFINDER
Giovanni Odone, La Rosiaz, Lausanne; Heinrich Kunz, Yverdon, and Willy Buch, Valeyres, sur Montagny, all of Switzerland, assignors to Paillard S. A., Sainte-Croix(Vaud), Switzerland
Filed Sept. 15, 1969, Ser. No. 858,004
Claims priority, application Switzerland, Sept. 26, 1968, 14403/68
Int. Cl. G01c 3/08
U.S. Cl. 356—4 6 Claims



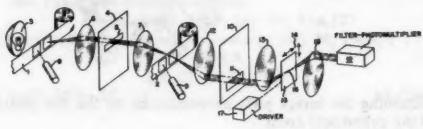

A rangefinder comprises a projector furnishing a modulated light beam directed on to the object to be ranged and a receiver to pick up the reflected rays. The rangefinder is designed to avoid disturbances of the readings by chance interference signals. The receiver has a photoelectric cell at the front and rear of a mirror on to which some of the reflected rays are converged by a lens. The photocells are mounted for axial displacement so as to adjust for equal light reception according to the convergence and hence the range of the rays reflected from the object. The signals from the photocells are cut off and connected by a device actuated in rhythm to conform to a constant phase relationship with the light beam modulation. The cut off device connects the receiver to a storage device for the measured signals in which the stored sums of the interfering signals give a substantially nil value. The storage device is an RC element whose time constant is several times that of the beam modulation. The circuit includes a differential amplifier. Output signals from "gate" circuits control the axial displacements of the photocells by supplying a motor driving a threaded shaft bearing a tapped nut supporting the photocells. A camera incorporating the rangefinder has an objective adjustment ring coupled to respond to rotation of the shaft.

3,652,161
METHOD AND ARRANGEMENT FOR MEASURING DISTANCES OPTICALLY WITH HIGH PRECISION
Dieter Ross, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Nov. 21, 1968, Ser. No. 777,676
Claims priority, application Germany, Dec. 1, 1967, P 16 23 564.6
Int. Cl. G01g 3/08
U.S. Cl. 356—5 17 Claims




Apparatus and method for measuring distance in which a coarse measurement of the distance is made by detecting the time of travel of a pulse and a precise measurement is made by using a measuring signal which is relatively short relative to the distance being measured and in which the ambiguity of the number of wave lengths between the direct and reflected wave is resolved by the coarse measurement.

3,652,162
COMPLEX DATA PROCESSING SYSTEM EMPLOYING INCOHERENT OPTICS
Milton L. Noble, Liverpool, N.Y., assignor to General Electric Company
Filed Mar. 14, 1968, Ser. No. 712,991
Int. Cl. G06k 9/08; G02B 5/18
U.S. Cl. 356—71 17 Claims




An optical system for processing analog information in the form of complex data without a requirement for coherent optics, wherein discrete pieces of data having magnitude and phase components are multiplied together in a parallel operation. Information to be processed is entered in the form of diffraction gratings upon a pair of spaced apart writing media, normally in a column-row arrangement of distinct resolution elements. Magnitude information is contained in the transmissivity of the resolution elements and phase information in the spatial frequency of the gratings. Processing of resolution element pairs is optically performed by imaging spatially filtered light from resolution elements of the first medium upon corresponding elements of the second medium by means of a telecentric lens arrangement, spatially filtered light from the second medium being detected to provide the processed information.

3,652,163
PHOTOMETER FOR OBSERVATION INSTRUMENTS MAINLY FOR MICROSCOPES
Wieslaw K. Borkowski; Maksymilian Pluta, and Maciej Popielas, all of Warszawa, Poland, assignors to Centralne Laboratorium Astyki, Warszawa, Poland
Filed Apr. 22, 1970, Ser. No. 30,798
Claims priority, application Poland, May 2, 1969, P 133336
Int. Cl. G01n 21/110; G02b 27/14
U.S. Cl. 356—115 4 Claims

Photometer enabling simultaneous observation of an object being investigated and of a measuring diaphragm, provided with visual and measuring systems, wherein one or two

polarizing been splitters divide the main light beam entering into the instrument into two beams which are linearly polarized. The image of the measuring diaphragm is projected on the background of the image of the object being investigated by means of special plates which turn the direction of the light vibrations and change the kind of light polarization from linear to circular. The images of the measuring diaphragm and of the investigated object are formed by two beams which are linearly polarized, whereby the directions of light vibrations are mutually perpendicular. The visual system of the photometer has a polarizing filter, enabling the controlling of the ratio of luminance of the measuring diaphragm image to that of the investigated object image.

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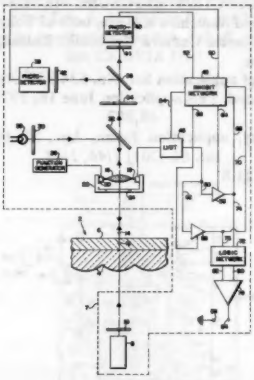
## 3,652,164
## RELATIVE BACK FOCUS MONITORING METHOD AND APPARATUS

**Faramarz Faramarzpour, Jamaica Plain, and Ernest W. Long, West Concord, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Filed May 1, 1970, Ser. No. 33,612**
**Int. Cl. G01b 9/00**
**U.S. Cl. 356—125** **22 Claims**



The subject invention generally provides a method and apparatus for determining the relative back focus of each of a plurality of lenticules or the like and, more particularly, provides for the determination of the relative back focus of each of a plurality of lenticules comprising a lenticular film which is disposed along one surface of a supporting web.

The relative back focus of each lenticule or the like may be generally defined as the distance from the focus of said lenticule or the like to a reference which, in the case of a web supported lenticular film, is the surface of the web opposite the lenticular film. Briefly, collimated light is passed through each of the lenticules and is focused by a moving microscopic objective which is positioned outward of the surface of the web opposite the lenticular film. The objective is moved toward and away from the web so as to vary the focal plane of the image received from one of the lenticules.

When the image of said one lenticule is focused at a predetermined point, it is detected by a photo-detector which provides an electrical output pulse indicative thereof. Means are provided for determining the position of the microscopic objective at the time of said pulse.

A source of light of a wavelength different from that of said collimated light is provided and transmits light, through said microscopic objective to the non-lenticulated side of said web such that it is reflected therefrom. This reflected light is brought to focus remote from said web by said microscopic objective. The microscopic objective is moved with respect to the web until said reflected light is brought to said same predetermined focus as said collimated light. When the reflected light is brought to said predetermined focus, it is detected by a second photo-detector which will provide an electrical output pulse in response thereto.

The position of the microscopic objective is determined at the time of the electrical output pulse responsive to said reflected light and the distance traversed by said microscopic objective and, hence, the relative back-focus of the particular lenticule being monitored, may be readily determined.

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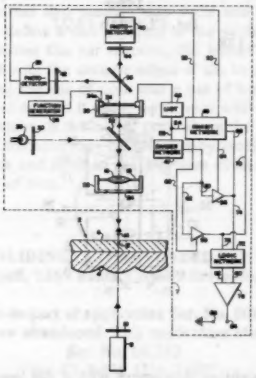
## 3,652,165
## RELATIVE BACK FOCUS MONITORING METHOD AND APPARATUS

**Edward S. Candidus, Jr., Boston; Thomas W. Snow, Melrose, and John F. Ullathorne, Duxbury, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Filed May 1, 1970, Ser. No. 33,660**
**Int. Cl. G01b 9/00**
**U.S. Cl. 356—125** **18 Claims**



The subject invention provides an improved method and apparatus for determining the relative back-focus of each of a plurality of lenticules or the like and, more particularly, provides a method and a means for sequentially determining the relative back-focus of each of a plurality of lenticules, comprising a lenticular film which is disposed along one surface of a supporting web.

The relative back-focus of each lenticule or the like may be generally defined as the distance from the focus of said lenticule or the like to a reference which, in the case of a web supported lenticular film, is the surface of the web opposite the lenticular film. Briefly, collimated light is passed through each of the lenticules and is focused by a stationary microscopic objective which is positioned outward of the surface of the web opposite the lenticular film. A movable aperture plate is positioned outward of the microscopic objective and is moved toward and away from said microscopic objective so that the position of the image of the focused collimated light varies with respect to said aperture plate.

When the image of said lenticule is focused in the plane of said aperture plate, it is detected by a photo-detector which provides an electrical output pulse indicative thereof. Means are provided for determining the position of the aperture plate at the time of said pulse.

A source of light of a wavelength different from that of said collimated light is provided and transmits light through said microscopic objective to the non-lenticulated side of said web so as to be reflected therefrom. This reflected light is focused remote from said web by said microscopic objective and the aperture plate is moved with respect to the

microscopic objective until said reflected light is focused in the plane of said aperture plate. When the reflected light is so focused, in the plane of the aperture plate, it is detected by a second photo-detector which will provide an electrical output pulse in response thereto.

The position of the microscopic objective is determined at the time of the electrical output pulse responsive to said reflected light, and the distance traversed by said aperture plate, between said output pulses, may be readily determined. For a given microscopic objective, the distance traversed by the aperture plate will be a multiple of the relative back-focus of the lenticule being monitored which is dependent on the focal length of the microscopic objective.

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**3,652,166**

## GEODETIC SIGHTING INSTRUMENT

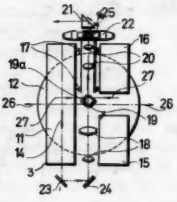
**Dezso Bessko; Gyula Gallai; Pal Farnady; Geza Jozsa; Margit Kovy; Laszlo Teller; Andras Suba, and Sandor Tisza, all of Budapest, Hungary, assignors to Magyar Optikai Muvek, Budapest, Hungary**

**Filed May 4, 1970, Ser. No. 34,416**

**Claims priority, application Hungary, May 16, 1969, MA-1989**

**Int. Cl. G01b** *11/27*

**U.S. Cl. 356—138** **10 Claims**




Geodetic sighting instrument with a gas laser light source and beaming, sighting and observation systems; the optical axis of said gas laser is arranged in a way free to rotate about a vertical axis and perpendicular to the direction of sighting. The instrument has a light reflecting system consisting of directive mirrors to direct the beam used for the marking of direction, a sighting reflecting device being interposed between said gas laser and said observation system including at least one reflecting device free to rotate about an axis perpendicular to the direction to be marked out.

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**3,652,167**

## OPTICAL IMAGE SPLITTING SYSTEMS

**Francis Hughes Smith, York, England, assignor to Vickers Limited, London, England**

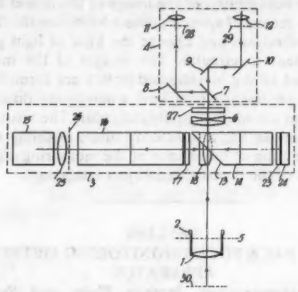
**Filed Apr. 28, 1970, Ser. No. 32,543**

**Claims priority, application Great Britain, Apr. 30, 1969, 22,127/69**

**Int. Cl. G01b** *11/02*

**U.S. Cl. 356—163** **25 Claims**

In a binocular optical sizing instrument, an adjustable image-splitting device is arranged, between an objective and the binocular viewing head, for use in measuring the diameters of viewed objects by the image-splitting method. The objective is arranged to form a primary real image of the field of view upstream of the common focal plane of the eyepieces of the binocular viewing head, and optical imaging means are positioned downstream of the primary real image to focus the field of view onto the said common focal plane. The optical system of the instrument is also arranged to form a real image of the objective's exit pupil at a point optically equivalent to the apparent image-splitting point of the device.



Such an image-splitting device can also be used in a monocular sizing instrument.

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**3,652,168**

## ELECTRIC EXPOSURE METER

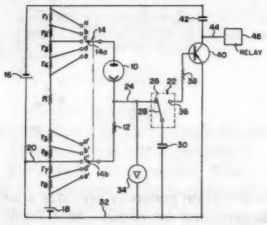
**Akio Yanagi, and Shoichiro Kakuta, both of Tokyo, Japan, assignors to Minolta Camera Kabushiki Kaisha, Minami-ku, Osaka, Japan**

**Continuation of application Ser. No. 634,320, Apr. 27, 1967, now abandoned. This application June 16, 1970, Ser. No. 48,903**

**Claims priority, application Japan, Apr. 29, 1966, 41/27268**

**Int. Cl. G01j** *1/46, 1/44*

**U.S. Cl. 356—21 S** **7 Claims**




An electric exposure meter for storing the brightness of a photographic object as an electric voltage of a magnitude corresponding thereto in order to control the exposure time by using the voltage thus stored.

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**3,652,169**

## VIEWER FOR TRANSPARENT SLIDES

**Bernard R. Danti, Lexington; Paul E. Brefka, Southboro, and Wayne S. Merrill, Bedford, all of Mass., assignors to Milliport Corporation, Bedford, Mass.**

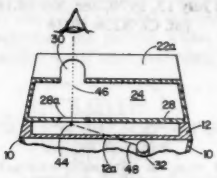
**Filed Apr. 1, 1971, Ser. No. 130,262**

**Int. Cl. G01n** *21/04*

**U.S. Cl. 356—244** **8 Claims**

A viewer for slides useful in clinical testing. The viewer is particularly useful for viewing precipitates formed in optically transparent or translucent gels contained in transparent trays. It includes a base member having side walls, a cover plate and a mask spaced above the cover plate. The slide is placed between the mask and the upper surface of the cover plate. Means are provided defining an entrance pupil above the mask. The slide is illuminated from a light source within the base. Light passes through a slit in the cover plate from the source to the location in the gel where the precipitate is

most likely to be present. The slit is however masked from the view of the user by the mask and entrance pupil. Thus, the precipitate is readily seen if present, since it diffuses the




light from source. If it is absent, only a black field of view is seen, since the upper surface of the cover plate is blackened in the viewing area.

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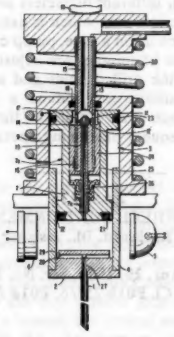
**3,652,170**

## PHOTOMETER CHAMBER

**Palle-Finn Beer, and Kai Robert Smith, both of Lidingo, Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden**

**Filed Feb. 5, 1970, Ser. No. 8,933**
**Claims priority, application Sweden, Feb. 5, 1969, 1493/69**
**Int. Cl. G01n *1/10***
**U.S. Cl. 356—246** **8 Claims**



An apparatus useful for measuring the optical properties of a liquid which comprises a cylinder having at least a portion thereof constructed of a transparent material, inlet means at one end of said cylinder for introducing liquid into the cylinder, outlet means at the other end of said cylinder, a piston slidably mounted in said cylinder to define a first portion and a second portion in said cylinder, said first portion being adjacent to said inlet means, a passageway through said piston communicating with said first and second portions and with said outlet means, a valve means positioned in said passageway and adapted to close said passageway when the volume of said first portion is increased by movement of the piston and to open said passageway when the volume of said first portion is decreased by movement of the piston.

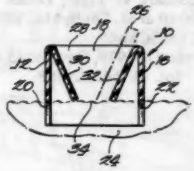
The apparatus permits reliable measurement of the transparency to light of light samples in the chamber by keeping the walls clean so that the light for one sample does not contaminate or otherwise affect a sample likewise subsequently drawn in.

**3,652,171**

## BUTTER APPLICATOR

**John W. Carlson, 6678 S. Acoma, Littleton, Colo.**

**Filed May 6, 1970, Ser. No. 35,070**
**Int. Cl. A23p *1/00***
**U.S. Cl. 401—12** **7 Claims**




Two of the four parallel side walls of the butter applicator have arcuate edges to receive the surface of an ear of corn and have ledges extending inwardly and downwardly from their top edges, which ledges extend across the space between the other two parallel side walls and stop short of each other to define a slot adjacent to the surface of the ear of corn. To butter the ear of corn, the butter applicator is placed upon it with the arcuate edges of the two parallel side walls straddling the ear of corn and a pat of butter is placed in its upper end so that it slides downward with its edge contacting the surface of the ear of corn along the slot whereby the surface of the corn may be buttered by moving the butter applicator back and forth in the direction of the longitudinal axis of the ear of corn.

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**3,652,172**

## SLIDING CLIP ACTUATED PEN

**Nathan A. Zepell, 1359 Santa Teresita Drive, Santa Barbara, Calif.**

**Continuation-in-part of application Ser. No. 808,743, Mar. 20, 1969, now abandoned. This application Mar. 4, 1970, Ser. No. 16,352**
**Int. Cl. B43k *5/16, 24/02***
**U.S. Cl. 401—106** **28 Claims**

A writing instrument has a hollow barrel with a reciprocable writing cartridge that is normally retracted by a spring and that is extended to writing position by sliding the clip. The clip mechanically engages the cartridge to extend it, and the ball of the clip fits in a recess in the barrel surface to hold the cartridge extended. Opening the clip to clip the pen in a pocket releases this hold on the cartridge, and the spring retracts the cartridge sliding the clip with it. The clip is so at-

tached that manual pressure on the clip end away from the ball rotates the clip to open it.

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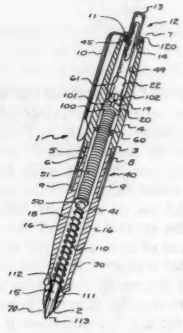
3,652,173

## RETRACTABLE BALLPOINT PEN WITH VARIABLE ENCLOSURE

Louis W. Miller; Leonard G. Lipic; Louise E. Kestler, and William M. Martz, all of St. Louis, Mo., assignors to Joseph Lipic Pen Co., St. Louis, Mo.

Filed June 11, 1970, Ser. No. 45,491
Int. Cl. B43k *24/08*
U.S. Cl. 401—110 13 Claims



A retractable ballpoint pen has a standard size, replaceable ink cartridge. The retracting mechanism is designed to pass over the ink cartridge along the entire length of the mechanism, allowing the use of a pen enclosure whose only length limitation is the length of ink cartridge utilized.

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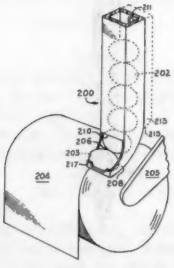
3,652,174

## HERMETICALLY-SEALED PRODUCTS AND RELATED METHOD FOR CLEANSING AND OTHER USES

Philip Boone, 15 Fenwick Road, Winchester, Mass.

Continuation-in-part of application Ser. No. 678,600, Oct. 27, 1967, now abandoned. This application Mar. 25, 1968, Ser. No. 715,768
Int. Cl. B65d *5/72*
U.S. Cl. 401—143 6 Claims



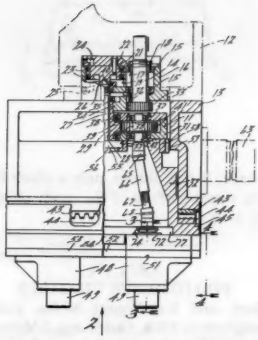
Products including hermetically sealed, openable, containers enclosing liquid, liquid impregnated, dry and other materials for use alone or in combination with associated or integral components such as sheetlike materials for cleaning, medical or other purposes, together with dispensing components therefor and related method.

3,652,175

## ADJUSTABLE MULTIPLE SPINDLER DRILL HEAD

William D. Walters, Ridgewood, and Robert J. Doocey, Upper Saddle River, both of N.J., assignors to Standard Tool & Manufacturing Co.

Filed July 13, 1970, Ser. No. 54,183
Int. Cl. B23b *39/16*
U.S. Cl. 408—46 9 Claims



The adjustable drill head of the multiple spindle type has particular use in transfer or like machine lines as it can produce different diametrically and angularly spaced drill holes which heretofore required a number of fixed multiple spindle drill heads although requiring an increase in time. The cost of each fixed multiple spindle drill head and the number required for different diameters and number of holes to be drilled results in a cost which is extremely high. When drilling a flange, such as on a pipe, pump casting and those of other devices, a pair of spindles are adjustably spaced to the diameter between the drilled holes and are indexed to different angular positions to produce a multiple of holes spaced equal distance apart within the time required to perform prior or subsequent machining operations at other stations in the line.

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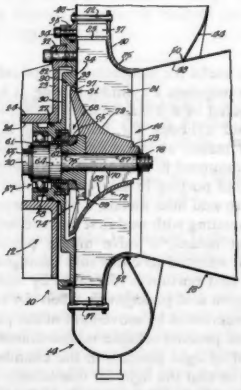
3,652,176

## TURBINE WHEEL CONTAINMENT DEVICE

Richard E. Walsh, Rockford, Ill., assignor to Sudstrand Corporation

Filed Apr. 20, 1970, Ser. No. 29,875
Int. Cl. F01b *25/16*; F01d *1/00*
U.S. Cl. 415—9 8 Claims



A containment construction for a radial turbine having a generally radially disposed inlet and an axially disposed out-

let with a stationary back-plate disposed opposite the outlet that has a conically diverging recess therein that receives a complementary rotating diverging conical shoulder on the turbine wheel hub so that upon overspeed bursting of the turbine wheel, the conical recess assists in containing the turbine wheel, there also being provided stationary stator blades completely surrounding the turbine wheel which assist in containing the turbine wheel upon exceeding the burst speed.

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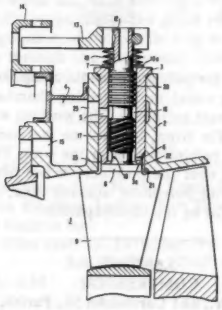
**3,652,177**

## INSTALLATION FOR THE SUPPORT OF PIVOTAL GUIDE BLADES

**Wolf Loebel, Munich, Germany, assignor to Motoren-und Turbinen-Union Munich GmbH, Germany**

**Filed May 19, 1970, Ser. No. 38,679**
**Claims priority, application Germany, May 23, 1969, P 19 26 327.5**
**Int. Cl. F01d** *11/00*; **F04d** *27/00*
**U.S. Cl. 415—110** **18 Claims**



An installation for the pivotal support of guide blades of turbo machines particularly gas turbines in which chambers or passages are provided in the bearing support through which flows the cooling air; the blade shaft constructed as adjusting shaft is provided with an annular groove in its center bearing area and with another annular groove at the blade end whereby the two annular grooves are connected with each other by a thread; the central annular groove is in communication with the chambers or passages while the other annular groove is in communication with the guide blade space of the machine.

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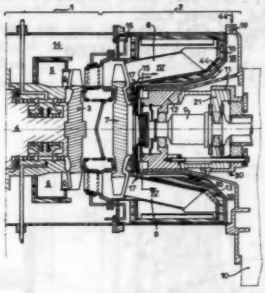
**3,652,178**

## DEVICE FOR THE OUTPUT SHAFT OF A GAS TURBINE

**Jack Guillot, Blanc-Mesnil, France, assignor to Bennes Marrel, Saint-Etienne (Loire), France**

**Filed Nov. 20, 1969, Ser. No. 878,472**
**Claims priority, application France, Nov. 28, 1968, 50.688**
**Int. Cl. F01d** *11/00*
**U.S. Cl. 415—110** **4 Claims**

The output shaft of a gas turbine is journaled by two spaced-apart bearings mounted in a support housing surrounding the shaft. The exhaust for the gas turbine is disposed radially outwardly of the support housing and an insulating sleeve is disposed intermediate the exhaust and the support housing. One of the bearings is fixed axially relative to the shaft and the support housing while the other bearing is mounted for limited axial play relative to the support housing and the shaft. Helical splines are formed on the shaft adjacent the rotor and cooperate with a circumferential sleeve to form a pump which will draw atmospheric air between the insulating sleeve and the support housing, through passages



in the bearing body and direct the air against the axially movable bearing to cool the same.

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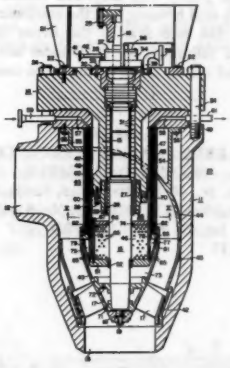
**3,652,179**

## CONTROLLED LEAKAGE CENTRIFUGAL PUMP

**Oskar Hagen, Greensburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Continuation of application Ser. No. 810,312, Mar. 25, 1969, now abandoned. This application Mar. 10, 1971, Ser. No. 123,039**
**Int. Cl. H02k** *15/00*; **F04d** *29/00*; **F16c** *1/24*
**U.S. Cl. 415—111** **23 Claims**



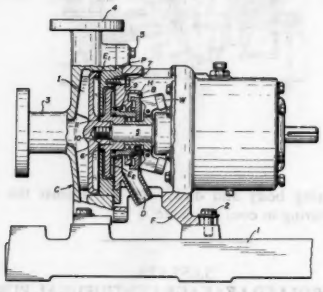
The cost of a centrifugal pump is reduced by providing it with a generally cylindrical casing having a radial discharge nozzle near the upper end of the casing and a suction nozzle at the lower end. The casing is bolted to a main flange having a cylindrical neck extending downwardly inside the casing. The pump shaft extends through the neck and the main flange. A radial bearing assembly is bolted to the lower end of the neck. In certain applications, breakdown bushings surround the shaft within the neck and controlled leakage shaft seals are disposed in the main flange, thereby confining the high pressure liquid within the casing and the main flange. A cooler surrounds the shaft between the pump impeller and the radial bearing assembly. A thermal barrier surrounds the bearing assembly.

3,652,180

## CENTRIFUGAL PUMP AND SEAL MEANS THEREFORE

Henry T. Choquette; Lawrence T. Gobble, both of Denver, Colo.; James B. Studebaker, Mexico City, Mexico, and John D. Whittier, Lakewood, Colo., assignors to A. R. Wilfley and Sons, Inc., Denver, Colo.

Filed July 13, 1970, Ser. No. 54,458
Int. Cl. F01d *11/00*
U.S. Cl. 415—113 12 Claims



The centrifugal pump has a mechanical seal means disposed between its casing and the shaft of the pump. The seal means has a first position in sealing engagement with a stationary seal ring housing under the influence of a spring when the pump is at rest, and a second position in unsealed relation with respect to the stationary seal housing when the pump reaches a predetermined operating speed. Expeller means are provided for effecting a hydraulic seal during operation of the pump and labyrinth means are provided between a rotary seal housing and the stationary seal housing for effecting a fail safe seal in the event there is severe mechanical seal failure. The mechanical seal means seals with pressure and is thus aided by the static case pressure.

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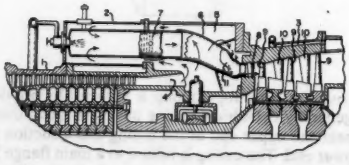
3,652,181

## COOLING SLEEVE FOR GAS TURBINE COMBUSTOR TRANSITION MEMBER

Carl F. Wilhelm, Jr., 40 Jennifer Road, Scotia, N.Y.

Filed Nov. 23, 1970, Ser. No. 91,659
Int. Cl. F01d *25/2*; F02c *7/12*
U.S. Cl. 415—117 3 Claims



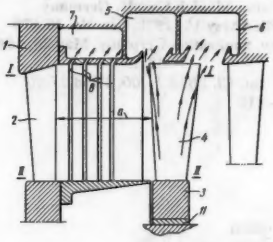
In a heavy duty gas turbine, the transition member leading from the combustion chamber outlet to the first turbine stage is cooled by means of a surrounding sleeve which admits compressor air on one side and which, after cooling the transition member, admits air into the hot combustion gas path to improve the radial temperature gradient at the turbine nozzle.

3,652,182

## TURBOSEPARATOR FOR POLYPHASE FLUIDS AND TURBINE INCORPORATING SAID TURBOSEPARATOR

Mikhail Efimovich Deich, Energeticheskaya ulitsa, 8 Korpus 1, kv. 56; Gennady Alexeevich Filippov, Molodogvardeiskaya ulitsa, 24, Korpus 1, kv. 34, both of Moscow; Sergei Petrovich Sobolev, Kharkov, 6 Molchanovsky pereulak, 7, kv. 5, Kharkov, and Oleg Alexeevich Povarov, Tashkentskaya ulitsa, 16, Korpus 1, kv. 55, Moscow, all of U.S.S.R.

Filed Apr. 1, 1970, Ser. No. 24,769
Int. Cl. F01d *1/00*
U.S. Cl. 415—168 3 Claims



A turboseparator for polyphase media comprising: a guide assembly, a working wheel, and collecting chambers installed near the working wheel periphery. The working wheel blades have a varying profile from the root to the periphery, this profile being of the turbine type near the root. The entrance angle of the profile near the periphery is not over 90°. In a turbine operating with polyphase working fluid, at least one stage is substituted for by the turboseparator.

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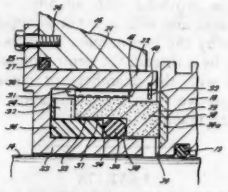
3,652,183

## COMPRESSOR

John E. Pottharst, Jr., 861 Carondelet St., Parish, La.

Filed Oct. 15, 1970, Ser. No. 80,952
Int. Cl. F01d *11/00*
U.S. Cl. 415—170 12 Claims



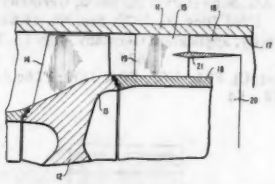
A compressor has an impeller shaft seal that includes a first ring mounted for rotation with the shaft and an annular cartridge fixed to an outer wall of the compressor housing through which the shaft extends. A second ring of carbon is mounted within the cartridge and has an end face urged into rotary sealing engagement with a mating end face of the first ring by a wavy spring in the cartridge. An O-ring is sealingly engaged between the inner wall of the cartridge and the inner face of the second ring to protect the spring against the corrosive fluid, and a sleeve about the inner wall limits movement of the O-ring toward the spring so that portions of the inner face of the second ring removed from such fluid will slide over the O-ring upon wear of the end face of the second ring.

3,652,184

## AFTER-GUIDE-BLADING OF AN AXIAL COMPRESSOR

Oswald Conrad, Schmiden, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed May 13, 1970, Ser. No. 36,752
Claims priority, application Germany, May 17, 1969, P 19 25 172.0
Int. Cl. F01d 1/02; F04d 29/02, 19/00
U.S. Cl. 415—181 19 Claims



An after-guide blading of an axial compressor, particularly of a supersonic axial compressor, in which a profile ring is provided between the walls defining the after-guide blading which partially projects into the guide blades; the cross-sectional configuration of the profile ring in a plane parallel to and passing through the compressor axis is such that it increases in a first section and decreases again in a second section.

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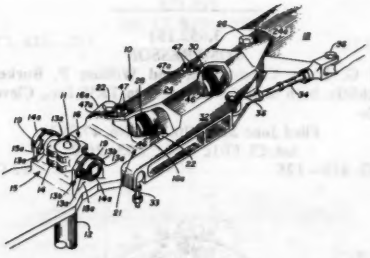
3,652,185

## ELASTOMERIC ROTOR BLADE MOUNT

Wesley Louis Cresap, Fort Worth; Castle Hugh Fagan, Irving, and Martin Harrison Lufkin, Fort Worth, all of Tex., assignors to Textron Inc.

Filed Mar. 13, 1970, Ser. No. 19,320
Int. Cl. B64c 27/48
U.S. Cl. 416—134 8 Claims



An elastomeric rotor mounting structure for a helicopter blade is provided. In the mounting, a blade grip is coupled to a yoke structure by means of radial-thrust elastomeric bearings and the yoke structure is connected to the rotor hub. The elastomeric bearings simplify the rotor design and eliminate the need for bearing lubrication.

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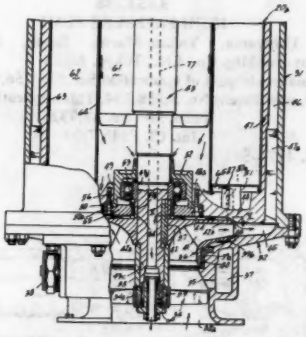
3,652,186

## PRESSURE LUBRICATED, COOLED AND THRUST BALANCED PUMP AND MOTOR UNIT

James C. Carter, Pasadena, Calif., assignor to The J. C. Carter Company, Costa Mesa, Calif.

Filed May 25, 1970, Ser. No. 40,077
Int. Cl. F04b 17/00, 35/00, 39/02, 35/04; G01f 11/30
U.S. Cl. 417—370 20 Claims

Electric motor driven pump units, especially suited for pumping liquefied gases, including cryogenic fluids, which are lubricated, cooled and balanced with small amounts of fluid pumped by the unit (pumpage), such as 1 to 3 percent of the designed flow capacity of the pump. These small amounts of pumpage are divided into a major flow path through the most heated portions of the units discharging on the pressure side of the pump and a minor flow path through a thrust bearing for the unit and then through the lesser heated portions to discharge on the intake side of the pump. The major flow path, receiving about 75 percent of the lubricating pumpage, is downwardly through the motor shaft



radial bearings and rotor compartment to an impeller and a pumping or collection chamber. The minor flow path, receiving about 25 percent of the lubricating pumpage, is through variable thrust bearing orifices tending to raise the motor shaft and carry the axial load of the unit on a thin film discharging through the hollow interior of the shaft to the pump inlet. The pumpage in the major flow path is maintained under pressure and will not boil even when appreciably heated. The minor flow path picks up very little heat and is primarily for balancing the axial thrust load on the shaft.

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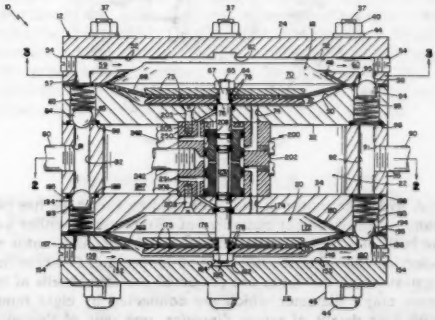
3,652,187

## PUMP

Herbert H. Loeffler, Arlington, and Sebastian B. Di Mauro, Malden, both of Mass., assignors to Amicon Corporation, Lexington, Mass.

Filed Oct. 29, 1970, Ser. No. 85,077
Int. Cl. F04b 17/00, 35/00
U.S. Cl. 417—393 12 Claims



A reciprocating fluid operated diaphragm-type pump has a control valve automatically movable at each end of the

reciprocating stroke of the pump between two alternate positions to reverse fluid flow to the pump, and thereby cause the pump to reciprocate. A connecting member between the diaphragms of the pump passes through a passage in the control valve and has sealing members located to alternately seal and exhaust the opposite ends of the control valve to pressurized fluid flowing out of the valve passage to the ends of the valve, so that control valve movement at the ends of the pump stroke is positive and rapid.

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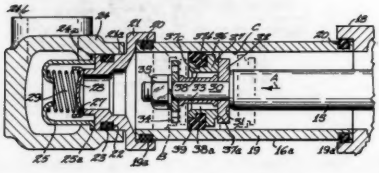
**3,652,188**
**HIGH PRESSURE PUMP**

**Ryoji Uchiyama, Yahata-Machi, Japan, assignor to Maruyama Mfg. Co., Ltd., Tokyo, Japan**

**Continuation-in-part of application Ser. No. 756,852, Sept. 3, 1968, now Patent No. 3,558,244. This application June 1, 1970, Ser. No. 41,932**
**Int. Cl. F04b** *7/00*
**U.S. Cl. 417—511** **3 Claims**



A high pressure pump with a self-centering piston loose on the piston rod carrying valve valving in cooperation with the piston.

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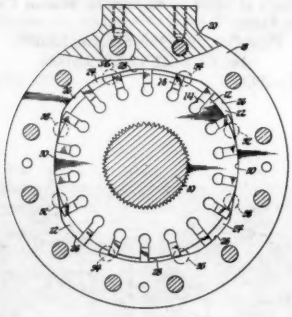
**3,652,189**
**POWER TRANSMISSION**

**John D. Gowie, Warren, Mich., assignor to Sperry Rand Corporation, Troy, Mich.**

**Filed Oct. 29, 1970, Ser. No. 85,061**
**Int. Cl. F01c** *1/00;* **F03c** *3/00;* **F04c** *1/00*
**U.S. Cl. 418—15** **1 Claim**



A hydraulic motor of the rotary sliding vane type has two pairs of displacement chambers of different size, either one or both of which may be utilized for driving the motor by selective control of the inlet and outlet porting. The cam ring against which the vanes are projected has four dwells of the same major diameter which are connected by eight ramps with four dwells of minor diameter, one pair of the latter being more than 25 percent greater in diameter than the other. This avoids functional difficulties inherent in similar vane motors in which all of the four minor dwells are of the same diameter and the two pairs of major dwells are of different diameter.

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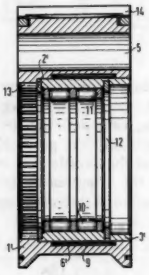
**3,652,190**
**ROTOR FOR A ROTARY INTERNAL COMBUSTION ENGINE**

**Helmut Keller, Garitz; Franz Rottmann, Schweinfurt am Main; Helmuth Zickler, Hambach, and Dieter Klauke, Schweinfurt am Main, all of Germany, assignors to Fichtel & Sachs AG, Schweinfurt am Main, Germany**

**Filed June 16, 1970, Ser. No. 46,640**
**Claims priority, application Germany, July 15, 1969, P 19 35 827.1**
**Int. Cl. F01c** *1/02;* **F04c** *1/02;* **F16c** *33/30*
**U.S. Cl. 418—54** **7 Claims**



The rotor of a rotary internal combustion engine has a lobed light metal body and a steel sleeve in a central axial bore of the body. The bearing which supports the rotor on an eccentric is mounted in the sleeve and protected against the heat absorbed from the burning fuel by the rotor body by a sealed annular chamber between radially opposite walls of the body and the sleeve.

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**3,652,191**
**COMPRESSOR**

**David G. King, Chesterland, and William P. Burke, Jr., Wickliffe, both of Ohio, assignors to TRW Inc., Cleveland, Ohio**

**Filed June 22, 1970, Ser. No. 47,993**
**Int. Cl. F01c** *19/02;* **F03c** *3/00*
**U.S. Cl. 418—125** **12 Claims**

A rotary vane compressor having a rotor eccentrically received in a cylindrical chamber. The rotor has radially movable vanes thereon, the outer peripheries of which carry shoes contacting the inner diameter of the cylinder wall. At the point of tangency between the rotor and inner diameter wall of the chamber, a groove is provided in the wall. A port

extends from the bottom wall of the groove to the high-pressure exit and a rectilinear tangency seal is received in the groove.

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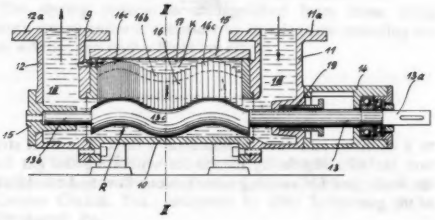
**3,652,192**
**SEALED CONVEYING APPARATUS**
**Hermann Kramer, and Karl-Heinz Hahn, both of Freiburg, Germany, assignors to Pumpen- Und Maschinenfabrik Lederle OHG, Freiburg, Germany**
**Filed Jan. 15, 1970, Ser. No. 3,173**
**Claims priority, application Germany, Jan. 16, 1969, P 19 02 065.6; Oct. 6, 1969, P 19 50 238.6**
**Int. Cl. F01c** *19/02, 11/00;* **F04c** *27/00*
**U.S. Cl. 418—125** **52 Claims**



A conveyor screw is mounted in a working chamber to convey a fluid material, and is sealed by a row or stack of sealing elements extending along a surface line of the conveyor screw perpendicular to the turns of the same.

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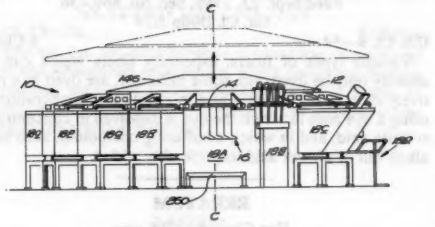
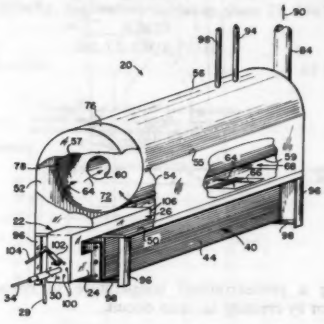
**3,652,193**
**SLUSH MOLDING MACHINE**
**Jaroslav F. Adamik, 412 Barden Ln., Warren, R.I.**
**Continuation of application Ser. No. 625,678, Mar. 24, 1967, now abandoned. This application Nov. 6, 1969, Ser. No. 871,591**
**Int. Cl. B29c** *5/00*
**U.S. Cl. 425—214** **27 Claims**



Slush-molding apparatus embodying a support for repeatedly intermittently moving a plurality of hollow molds from one station to another along a predetermined path and apparatus at these stations for successively filling the hollow molds with liquid plastic, applying heat to form a gelled layer internally of each mold, discharging the excess liquid plastic, partially curing the residual layer in each mold, and, finally, curing the residual layer. Additionally, there is apparatus for increasing the thickness of the gelled layer in certain areas and for adding plastic to certain areas of the partially cured layer.

**3,652,194**
**BLUE-FLAME LIQUID-FUEL BURNER PROCESS, APPARATUS AND UTILIZATION SYSTEMS**
**Frank W. Bailey, 663 Black Oak Ridge Road, Wayne, N.J.**
**Filed Sept. 24, 1969, Ser. No. 860,662**
**Int. Cl. F23m** *9/06*
**U.S. Cl. 431—9** **12 Claims**



Blue-flame burner process, apparatus and utilization systems producing a quiet, stable, essentially sootless blue flame from liquid fuel, particularly hydrocarbon fuels, fuel oil and the like and producing substantially complete combustion of the fuel, being more efficient than conventional oil burners and eliminating particulate matter in the exhaust products, contributing to substantially reduced air pollution and additionally providing more efficient utilization of the heat generated. In the blue-flame process the kinetics of combustion are controlled by close and effective coupling to a heat sink, and novel close coupling systems with higher performance heat exchangers are provided. Compact, lightweight inexpensive burner units are provided which are adapted to be constructed with a generally rectangular J-shaped configuration adapted for close coupling to a planar area of a heat sink, if desired in certain embodiments; the rectangular configuration lends itself to convenient, inexpensive sheet metal construction suitable for large scale mass production techniques. The fuel nozzle, ignition device and damper controls are located at the base of the shorter leg of the J-shaped burner unit where they can be readily accessible for convenient adjustment to optimum settings during actual operation. The rectangular burner configuration is versatile for use in many different applications, environments and utilization systems as described, including applications similar to those which have heretofore been limited to gas burners and for modular arrangements of multiple burners stacked side-by-side for great heat release in a relatively compact volume. Multifuel burning capability is provided for interchangeably using fuel oil, kerosene or gasoline while achieving substantially the same desirable blue-flame characteristics in each case, suitable for mobile home applications, emergency heating, garages, use in remote locations, etc. A relatively cool fluepipe is achieved such that the conventional expensive brick or tile chimney can be eliminated.

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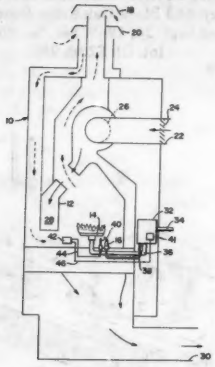
**3,652,195**
**THERMOCOUPLE CONTROL SYSTEM**
**Harold A. McIntosh, South Pasadena; Gordon K. Slocum, Downey, both of Calif., and Nick J. Koskolos, St. Louis, Mo., assignors to Robertshaw Controls Company, Richmond, Va. and Intertherm, Inc., St. Louis, Mo.**
**Filed Dec. 11, 1969, Ser. No. 884,063**
**Int. Cl. F23n** *5/02*
**U.S. Cl. 431—21** **12 Claims**

A thermocouple control system including a thermocouple, an operator for a control device and a fusible link assembly

connected in series with the thermocouple and the operator, the fusible link assembly assuming an open state upon



sensing a predetermined temperature to deenergize the operator by creating an open circuit.

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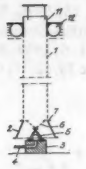
**3,652,196**

**FLOATING TORCHER WITH PERMEABLE GAS CONDUIT FOR UNDERWATER OIL FIELDS**

**Henri A. Marion; Pierre P. Orieux, and Francisco M. Serrano, all of Paris, France, assignors to Compagnie Francaise Des Petroles, Societe Anonyme, Paris, France**

**Filed Oct. 12, 1970, Ser. No. 79,788**
**Claims priority, application France, Oct. 10, 1969, 6934682**
**Int. Cl. F23d *13/20***
**U.S. Cl. 431—202** **14 Claims**

A torch assembly for burning gases collected at the head of an underwater well which incorporates a thin permeable conduit made from lightweight, inexpensive material for conducting the gases to the water surface. One end of the conduit is secured to a hood placed above the gas outlet and anchored to the ocean bottom and the other end is attached



to a chimney structure mounted on a float. The float structure includes regulating means for separating the gas from the water and for assuring a continuous flow and combustion of the gas.

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**3,652,197**

**NONCONSUMABLE WICK**

**Richard D. Tokarz, 1103 Sunset, Richland, Wash.**

**Filed May 12, 1970, Ser. No. 36,642**
**U.S. Cl. 431—326** **8 Claims**

A wick is formed by a plurality of hollow ceramic microspheres adhered together with epoxy resin which is capable of absorbing flammable liquids and transporting the liquid by capillary action above the reservoir of the flammable liquid.

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# CHEMICAL

**3,652,198**

**MIXTURE OF FILAMENTS CAPABLE OF BEING DYED TO A MULTICOLOR PATTERN WITH ANIONIC DISPERSE DYES**

**Milton Farber, Verona, N.J.; Robert Miller, and Charles N. Brown, both of Columbia, S.C., assignors to Uniroyal, Inc., New York, N.Y.**

**Filed Sept. 13, 1968, Ser. No. 759,776. The portion of the term of the patent subsequent to Jan. 2, 1985, has been disclaimed.**
**Int. Cl. D06p *5/02, 1/16***
**U.S. Cl. 8—15** **50 Claims**

The present invention relates to a process for dyeing fibers, fabrics or other shaped articles made from blends of either poly(alpha-olefins) or polyesters and various thermoplastic nitrogen-containing basic polymers to a multicolor pattern.

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**3,652,199**

**PROCESS FOR DRYING POLYAMIDE FIBERS CATONIC DYES AND ZINC THIOCYANATE**

**Peter S. K. Leung, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed Aug. 28, 1969, Ser. No. 853,924**
**Int. Cl. D06p *3/24***
**U.S. Cl. 8—30** **5 Claims**

Process for dyeing polyamide fibers with a cationic dye comprising treating said fibers with an aqueous bath containing a cationic dye and zinc thiocyanate at a temperature of at least 90° C.

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**3,652,200**

**CONCENTRATED SULFURIC ACID-DYE SOLUTION DYEING**

**Kazuo Miyasaka, 1-33 Tokiwadia, Itabashi-ku, Tokyo, Japan**

**Filed Sept. 23, 1969, Ser. No. 860,436**
**Int. Cl. D06p *3/14***
**U.S. Cl. 8—54** **5 Claims**

Various types of fibers, especially fibers which can ordinarily only be dyed with some difficulty, are dyed in a relatively short period of time at a relatively low temperature by using a dye bath in which the dye is dissolved in concentrated sulfuric acid, and in which a buffering compound, such as an alkali salt of a weak acid, is preferably added.

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**ERRATUM**

For Class 8—115 see:
Patent No. 3,652,212

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**3,652,201**

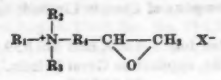
**PROCESS FOR THE PRODUCTION OF DYEINGS ON FIBER MATERIAL CONSISTING OF POLYMERIC OR COPOLYMERIC ACRYLONITRILE**

**Jakob Bindler, Riehen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland**

**Filed Apr. 28, 1969, Ser. No. 819,976**
**Claims priority, application Switzerland, Apr. 30, 1968, 6438/68**
**Int. Cl. D06p *5/06***
**U.S. Cl. 8—172** **9 Claims**

A process for the production of level dyeings on polymeric or copolymeric acrylonitrile fibers by dyeing said fibers with

a dye liquor containing a basic dyestuff and as dye assistant a quaternary ammonium compound of the formula



wherein $R_1$ represents an aliphatic hydrocarbon radical with at least eight carbon atoms, $R_2$ represents a lower alkyl radical, $R_3$ represents a lower alkyl radical optionally substituted by hydroxyl and/or phenyl groups, $R_4$ represents a lower alkylene bridge and $X^-$ represents the anion equivalent of an acid such as, e.g., $Cl^-$ or $Br^-$, is described.

The dyeing process is distinguished from those using known strong cationic retarders by its adequate retarding action without any undue blocking effect.

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**3,652,202**

**PRODUCTION OF SODIUM CARBONATE**

**Dorothy Ann Stewart, and Bernard Allen Maloney, both of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Mar. 12, 1969, Ser. No. 806,690**
**Int. Cl. C01d** *7/00;* **C01b** *31/24*
**U.S. Cl. 23—63** **6 Claims**

Electrolytic cell liquor (aqueous sodium hydroxide) is carbonated to produce sodium carbonate. Sodium carbonate is then separated as sodium carbonate monohydrate crystals of desirable physical properties, notably low friability and high bulk density by overcoming the adverse effect of organic impurities which are present during crystallization.

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**3,652,203**

**SIMULTANEOUS PREPARATION OF CARBONYL SULFIDE AND AMMONIUM THIOCYANATE**

**Shizuo Nakamura, Tokyo, and Masanobu Ito, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan**

**Filed Sept. 29, 1970, Ser. No. 76,640**
**Int. Cl. C01c** *3/20;* **C01b** *31/26*
**U.S. Cl. 23—75** **6 Claims**

A process for the simultaneous preparation of carbonyl sulfide and ammonium thiocyanate, which comprises heating and reacting urea with carbon disulfide at liquid phase, in aliphatic monohydric alcohol of one to four carbon atoms serving as the reaction medium.

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**3,652,204**

**PRODUCTION OF CHROMIUM-CONTAINING PHOSPHORIC ACID OR PHOSPHATE SOLUTION**

**Hakuichi Akazawa, and Shigeaki Washio, both of Kokogawa, Japan, assignors to Taki Fertilizer Manufacturing Co., Ltd., Kokogawa, Japan**

**Filed Sept. 30, 1969, Ser. No. 862,508**
**Claims priority, application Japan, Oct. 12, 1968, 43/74456**
**Int. Cl. C01b** *25/26*
**U.S. Cl. 23—105** **6 Claims**

Process for econômically producing chromium-containing phosphoric acid solution by reacting phosphoric acid produced by the wet process, containing hydrofluosilicic acid, with a chromate and removing the precipitated silicofluoride.

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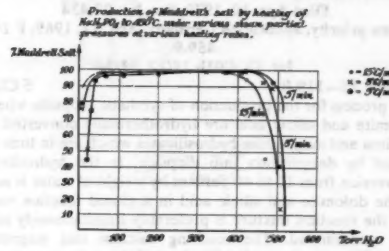
**3,652,205**

**PROCESS FOR THE MANUFACTURE OF MADRELL'S SALT**

**Winfried Kern, Hurth near Cologne; Gero Heymer, Knapsack near Cologne, and Heinz Harnisch, Lovenich near Cologne, all of Germany, assignors to Knapsack Aktiengesellschaft, Knapsack near Cologne, Germany**

**Filed June 6, 1968, Ser. No. 734,941**
**Claims priority, application Germany, June 27, 1967, K 62653**
**Int. Cl. C01b** *25/30*
**U.S. Cl. 23—106** **10 Claims**




Production of Maddrell's salt by heating feed material consisting of monobasic sodium phosphate to a temperature substantially of 450° C., comprising carrying out the heating step in the temperature range between 200° and 450° C. while maintaining in the feed material a steam partial pressure between 50 and 450 mm. mercury.

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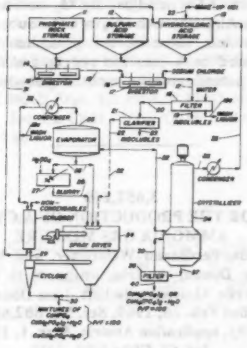
**3,652,206**

**DEFLUORINATED CALCIUM PHOSPHATE COMPOSITIONS, AND METHOD OF PREPARING AND USING SAME**

**Ashok Babubhai Amin, Princeton, N.J., assignor to American Cyanamid Company, Stamford, Conn.**

**Filed Jan. 17, 1969, Ser. No. 791,944**
**Int. Cl. C01b** *25/32*
**U.S. Cl. 23—109** **6 Claims**




Novel feed grade calcium phosphate compositions are provided which contain calcium chlorophosphate in varying amounts. This novel composition and other heretofore known varieties of feed grade calcium phosphates are prepared by low temperature drying steps (spray drying or crystallization-evaporation) of solutions or slurries which have been partially defluorinated to the extent that the solution P/F ratio is at least 30–35 but less than 100. The novel

compositions described above have adequate levels of phosphorus availability to animals thereby permitting their usage as an animal feed supplement.

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3,652,207

## PROCESS FOR THE PRODUCTION OF SYNTHETIC DIOPSIDE

**Josef Wuhrer, Wulfrath; Heinz-Georg Kurczyk, Monchengladbach, and Adrian Ottenheym, Wulfrath, all of Germany, assignors to Rheinische Kalksteinwerke GmbH, Wulfrath, Germany**

**Filed Apr. 10, 1970, Ser. No. 27,434**

**Claims priority, application Germany, Apr. 11, 1969, P 19 18 459.9**

**Int. Cl. C01b** *33/22, 33/24*

**U.S. Cl. 23—110 R** **5 Claims**

A process for the production of synthetic diopside wherein dolomite and silicic acid are hydrothermally converted into calcium and magnesium hydrosilicates which are in turn converted by dehydration into diopside. In the hydrothermal conversion from 10 to 40 percent by weight of water is added to the dolomite and silicic acid in a closed reaction vessel, and the reaction mixture is preferably simultaneously mixed and comminuted. The resulting calcium and magnesium hydrosilicates are preferably heated to a temperature of 1,200° to 1,250° C. and are converted into diopside.

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3,652,208

## ALUMINA EXTRACTION FROM ALUMINO-SILICATE ORES AND POTASSIUM SULFATE ORES

**Maksymilian Burk, Los Angeles; William M. Bowes, Palos Verdes Estates, and Herman C. Krieg, Jr., Palos Verdes Peninsula, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.**

**Filed May 4, 1970, Ser. No. 34,478**

**Int. Cl. C01f** *7/12*

**U.S. Cl. 23—143** **9 Claims**

Alumino-silicate ore and a potassium sulfate bearing ore such as polyhalite or langbeinite are reacted by reducing and then calcining. Reduction decomposes the reactants and produces $H_2S$. Calcining produces a sinter containing potassium aluminate and silicates. The aluminate is leached from the sinter with KOH and/or $K_2CO_3$ solution and then precipitated to $Al(OH)_3$ with $SO_2$ or $CO_2$. Subsequent calcining yields alumina; some of the potassium carbonate or sulfite is recycled back into the system and the balance is converted to potassium salts such as potassium sulfate or potash.

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3,652,209

## PROCESS FOR THE PRODUCTION OF A CYANIC ACID-AMMONIA GAS MIXTURE

**Alfred Schmidt; Ferdinand Weinrotter, and Walter Muller, all of Linz Donau, Austria, assignors to Osteneichische Stickstoffwerke Aktiengesellschaft, Linz Donau, Austria**

**Filed Feb. 26, 1969, Ser. No. 802,685**

**Claims priority, application Austria, Mar. 1, 1968, 1988/68**

**Int. Cl. C01c** *3/00, 1/00*

**U.S. Cl. 23—151** **4 Claims**

The present invention is directed to a method of producing a gaseous mixture of cyanic acid and ammonia of low cyanuric acid content by introducing molten urea in a fluidized bed of at least 330° C. wherein it is heated to 300° to 480° C. within less than 1 second, the urea being introduced through the injection point with the latter being surrounded concentrically by a blowing gas issuing around the molten urea at a speed between 20 m./sec. to 100 m./sec.

3,652,210

## DEARSENICATION OF PHOSPHATE ROCK

**Raymond Anthony Smith, Walsall, and John Norman Sansom, Birmingham, both of England, assignors to Electric Reduction Company of Canada Limited, Islington, Ontario, Canada**

**Filed July 3, 1969, Ser. No. 839,043**

**Claims priority, application Great Britain, July 11, 1968, 33,065/68**

**Int. Cl. C01b** *25/00, 25/02, 25/12*

**U.S. Cl. 23—165** **12 Claims**

Elemental phosphorus suitable for conversion in $P_2O_5$ for use in foodstuffs as a result of its low arsenic content, is obtained via the electrothermal route from phosphate rock which has previously been mixed with sufficient phosphoric acid to reduce the CaO to $P_2O_5$ ratio to below 3 : 1 and then calcined at at least 1,000° C.

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3,652,211

## PROCESS FOR THE PREPARATION OF AN ANHYDRIDE OF TRIVALENT PHOSPHORUS USING EXCITED CARBON DIOXIDE OR NITRIC OXIDE

**Eugene J. Mezey, Upper Arlington, and Robert E. Hall, Wyoming, both of Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio**

**Filed Sept. 25, 1969, Ser. No. 861,159**

**Int. Cl. C01b** *25/00, 25/12, 25/16*

**U.S. Cl. 23—165** **13 Claims**

A process for preparing an anhydride of trivalent phosphorus from elemental phosphorus using an electronically-excited carbon dioxide plasma stream or an electronically-excited nitric oxide plasma stream is disclosed. The anhydride of trivalent phosphorus is useful as an intermediate in the preparation of detergency builders for use in detergent compositions.

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3,652,212

## MULTI-STEP IN SITU POLYMER FORMATION TO PRODUCE FABRIC HAVING IMPROVED SOILING CHARACTERISTICS

**Greville Machell, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.**

**Filed Apr. 17, 1967, Ser. No. 631,165. The portion of the term of the patent subsequent to Apr. 9, 1985, has been disclaimed.**

**Int. Cl. D06m** *15/36, 15/58, 15/72*

**U.S. Cl. 8—115.5** **17 Claims**

A process for improving soil release characteristics of textile material which comprises applying thereto a polymerizable compound and forming in situ a synthetic acid polymer comprising at least 10 weight percent acid calculated as acrylic acid, and the product produced by this process. Preferably, a textile resin and a textile resin catalyst also are applied to the textile material and the treated textile material is subjected to resin curing conditions.

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3,652,213

## PROCESS FOR THE PREPARATION OF AN ANHYDRIDE OF TRIVALENT PHOSPHORUS

**Horatio H. Krause; Justin S. McNulty, both of Columbus, and Robert E. Hall, Wyoming, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Sept. 25, 1969, Ser. No. 861,164**

**Int. Cl. C01b** *25/12, 25/00*

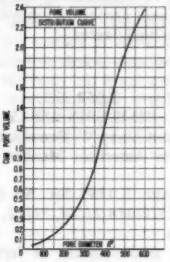
**U.S. Cl. 23—165** **8 Claims**

A process for the preparation of an anhydride of trivalent phosphorus comprising subjecting elemental phosphorus to a plasma stream of thermally- and electronically-excited carbon dioxide is disclosed. The anhydride of trivalent phosphorus is useful as an intermediate in the preparation of detergency builders for use in detergent compositions.

## 3,652,214
## PREPARATION OF SILICA GELS

Henri A. Aboutboul; Jerome H. Krekeler, both of Cincinnati, Ohio, and William Kirch, Clinton, Iowa, assignors to National Petro Chemicals Company, Inc., New York, N.Y.

Filed Aug. 6, 1968, Ser. No. 750,733
Int. Cl. C01b 33/16
U.S. Cl. 23—182 16 Claims

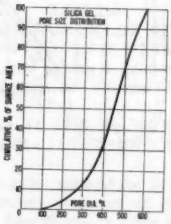


Silica gels having narrow pore diameter distribution in the range of 300–600 A and surface areas in the range from 200–500 m.²/g., and the process of preparing such silica gels directly from water, comprising critically controlled steps of precipitation of the silica gel, heat aging the precipitated silica hydrogel slurry, washing the aged product with solutions of salts having a displacing effect on sodium, disintegrating the gel and freeze drying the hydrogel so as to remove substantially all of the water i.e., vacuum subliming the water from the gel after freezing said hydrogel particles at a temperature sufficient to maintain the water in the pores in the frozen state.

## 3,652,215
## PREPARATION OF SILICA GELS

Henri A. Aboutboul, Cincinnati, Ohio; William Kirch, Clinton, Iowa, and Jerome H. Krekeler, Cincinnati, Ohio, assignors to National Petro Chemicals Company, Inc., New York, N.Y.

Filed Aug. 6, 1968, Ser. No. 750,734
Int. Cl. C01b 32/16
U.S. Cl. 23—182 R 19 Claims

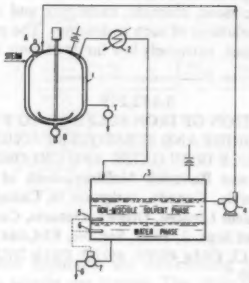


Silica xerogels having narrow pore diameter distribution in the range of 300–600 A. and surface areas in the range of from 200–500 m.²/g., and process for preparing such silica xerogels comprising critically controlled steps of precipitation of the silica gel, heat aging the precipitated silica hydrogel slurry, washing the aged product with solutions of salts having a displacing effect on sodium, disintegrating the gel, displacing the water, drying the gel and calcining.

## 3,652,216
## PREPARATION OF SILICA GELS

Jerome H. Krekeler; Henri A. Aboutboul, both of Cincinnati, Ohio, and William Kirch, Clinton, Iowa, assignors to National Petro Chemicals Company, Inc., New York, N.Y.

Filed Oct. 11, 1968, Ser. No. 766,693
Int. Cl. C01b 33/16
U.S. Cl. 23—182 18 Claims

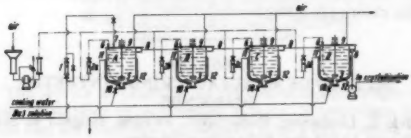


Silica xerogels having a narrow pore diameter distribution in the range of 300–600 A. and surface areas in the range from 200–500 m.²/g. and the process of preparing such xerogels comprising critically controlled steps of precipitation of the silica gel, heat aging the precipitated silica hydrogel slurry, washing the aged product with solutions of salts having displacing effect on sodium, disintegrating the gel, drying the gel by azeotropic distillation with a solvent which is nonmiscible with water, and calcining. Also, a process for preparing such xerogels wherein the non-water miscible solvent is continuously recycled so that a minimum amount of solvent need be used.

## 3,652,217
## METHOD FOR THE PRODUCTION OF BARIUM HYDROXIDE

Giulio Kemeny, Massa; Mario Gaboardi, Verona; Aldo Santini; Mario Testori, both of Massa; Paul-Dietrich Reinhardt, Marina Di Massa, all of Italy; Hartmut Simoleit, and Ludwig Walter, both of Hanover, Germany, assignors to Kali-Chemical Aktiengesellschaft, Hanover, Germany

Filed Sept. 11, 1969, Ser. No. 857,049
Claims priority, application Germany, Sept. 11, 1968, P 17 92 505.2; Sept. 12, 1968, P 17 92 515.4
Int. Cl. C01f 11/10; C01b 17/64
U.S. Cl. 23—186 17 Claims



The continuous production of barium hydroxide by the oxidation of a barium polysulfide-containing-barium sulfide solution using oxygen-containing gases is carried out between 45° and 80° C. in several stages placed in series. The oxidation is stopped at a point within specified values. Also, certain molar ratios of total sulfur to monosulfide sulfur in the barium sulfide-starting solution are maintained. Liquors obtained during recrystallization can be purified by a stagewise oxidation.

## 3,652,218
## LOW IMPURITY HYDRAZINE

James G. Rigsby, Lake Charles, La., assignor to Olin Corporation, New Haven, Conn.

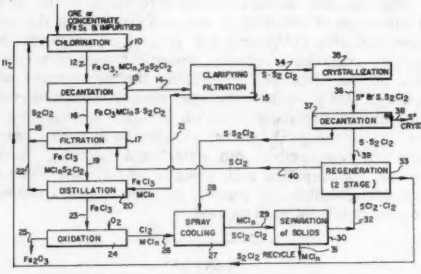
Filed Dec. 2, 1969, Ser. No. 881,589
Int. Cl. C01c 1/00
U.S. Cl. 23—190 R 6 Claims

This invention relates to the purification of aqueous solutions of hydrazine and lower alkyl hydrazines to remove impurities. More particularly, it relates to the removal of sodium and other cations, chloride, carbonate and other anions from aqueous solutions of such hydrazines. The product solutions have, at most, extremely low limits of ionic impurities.

## 3,652,219
## CHLORINATION OF IRON SULFIDES TO PRODUCE FERRIC CHLORIDE AND SUBSEQUENT OXIDATION TO PRODUCE IRON OXIDE AND CHLORINE

Ernest Peters, and Roderick McElroy, both of Vancouver, British Columbia, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Sept. 2, 1969, Ser. No. 854,444
Int. Cl. C01g 49/06, 49/10; C01b 7/02
U.S. Cl. 23—200 15 Claims




A process for decomposing iron sulfides in which finely ground iron sulfide is chlorinated with five to eight times the stoichiometrically required amount of liquid $S_2Cl_2$ containing dissolved elemental sulfur. After the chlorination, the solid material rich in ferric chloride is removed by decantation, filtration, etc., and the liquid consisting of excess $S_2Cl_2$ with elemental sulfur dissolved therein is cooled to crystallize out some of the elemental sulfur.

The ferric chloride is oxidized with oxygen to form iron oxide and chlorine. The iron oxide is recovered while the chlorine is used to regenerate the liquid $S_2Cl_2$ still containing some dissolved sulfur and the regenerated $S_2Cl_2$ is returned to the chlorination stage.

## 3,652,220
## METHOD OF MANUFACTURING SYNTHETIC DIAMONDS

Cedric E. Lindstrom, Robertsfors, Sweden, assignor to Scandimant Aktiebolag, Robertsfors, Sweden

Continuation of application Ser. No. 612,483, Jan. 30, 1967, now abandoned. This application May 13, 1970, Ser. No. 37,425
Claims priority, application Sweden, Feb. 11, 1966, 1754/66; June 23. 1966, 8611/69
Int. Cl. C01b 31/06
U.S. Cl. 23—209.1 3 Claims

Synthetic diamonds are produced by subjecting carbonaceous material to heat and pressure in the presence of a metallic solvent having projecting portions.

## 3,652,221
## PROCESS FOR PRODUCING CARBON FIBERS

William Edward Sloka, Fostoria, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 7, 1969, Ser. No. 814,161
Int. Cl. C01b 31/07
U.S. Cl. 23—209.4 12 Claims

Carbon fibers are produced by carbonizing a partially carbonized cellulosic base fiber by subjecting it to a temperature within the range of from 1,900° to 2,100° C. while under an applied tensional force. The carbon fibers produced in this manner are capable of withstanding the application of high stress during subsequent graphitization without breaking and can be stretched to a high degree.

## 3,652,222
## BILIRUBIN ASSAY

Jerry W. Denney, and Larry W. Denney, both of Indianapolis, Ind., assignors to American Monitor Corporation, Indianapolis, Ind.

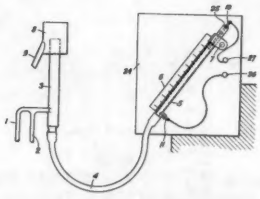
Filed Apr. 7, 1969, Ser. No. 814,161
Int. Cl. G01n 21/24, 31/22, 33/16
U.S. Cl. 23—230 B 9 Claims

The use of an acid solution of hydroxylamine in the analytical determination of the quantity of direct-reacting and indirect-reacting bilirubin present in blood serum or body fluids, to block reaction of bilirubin after a certain stage of the assay and to prevent interference of substances contained in erythrocytes in the assay and to stabilize the azobilirubin color formed in the reaction, and also the use of a form of hydroxylamine in place of the unstable ascorbic acids used in certain assay procedures.

## 3,652,223
## METHOD AND APPARATUS FOR CONTINUOUSLY MEASURING THE CONCENTRATION OF A REACTANT IN A LIQUID CARRIER

Borivoj Ludvik, Jaromer, Czechoslovakia, assignor to Vyzkumny ustav zuslechtovaci, Dvur Kralove nad Labem, Czechoslovakia

Filed Aug. 5, 1969, Ser. No. 847,546
Int. Cl. G01l 7/18; G01n 9/26, 27/10
U.S. Cl. 23—230 R 12 Claims



The concentration of a reactant in a liquid carrier is continuously determined by continuously mixing the carrier with another one containing a reactant capable to react with the tested reactant under gas generation, and by continuously measuring changes in either the overall specific gravity of the resulting gas/liquid mixture, or the overall electrical conductivity of the mixture. Suitable simple apparatus is shown.

3,652,224

## METHOD FOR DETECTING CRACKS IN METAL BODIES

Lyman A. Johnson, and Michael F. Henry, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,695
Int. Cl. G01n 21/16, 21/38; C23f 7/26
U.S. Cl. 23—230 R 9 Claims

A nondestructive method for detecting cracks in a metal body by selective corrosion of the surface portion within the cracks to enlarge them sufficiently so that they can then be detected by conventional techniques. Specifically, a crack enlarging solution which is an electrolyte containing halide ions is applied to the surface of the body to be tested. The solution is formulated so that it does not corrode the open surface portion of the body but is sufficiently reactive to corrode the surface portion within cracks. A conventional penetrating dye liquid is then applied to the same surface of the metal body and the cracks are detected in a conventional manner.

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3,652,225

## COLOR METHOD FOR DETECTING CRACKS IN METAL BODIES

Louis F. Coffin, Jr., and Lyman A. Johnson, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,696
Int. Cl. G01n 21/16, 21/38; C23f 7/26
U.S. Cl. 23—230 R 7 Claims

A nondestructive color method for detecting cracks in a metal body by selective corrosion of the surface portion within the cracks. Specifically, a color-forming aqueous acid indicating solution containing halide ions and a color-forming indicator is applied to the surface of the body to be tested. The solution is formulated so that it does not corrode to any significant extent the open surface portion of the body but is sufficiently reactive to corrode the surface portion within cracks resulting in the formation of metallic ions. The color-forming indicator is of the type which reacts with the thus formed metal ions to form a distinctive colored compound at the crack locations.

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3,652,226

## ANODIC INHIBITOR-COLOR METHOD FOR DETECTING CRACKS IN METAL BODIES

Louis F. Coffin, Jr., and Lyman A. Johnson, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,699
Int. Cl. G01n 21/16, 21/38; C23f 7/26
U.S. Cl. 23—230 R 10 Claims

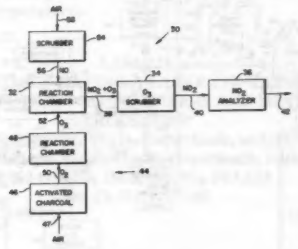
A nondestructive color method for detecting cracks in a metal body by selective corrosion of the surface portion within the cracks. Specifically, a color-forming electrolyte containing halide ions, a color-forming indicator and an anodic inhibitor is applied to the surface of the body to be tested. The electrolyte solution is formulated so that it does not corrode to any significant extent the open surface portion of the body but is sufficiently reactive to corrode the surface portion within cracks, resulting in the formation of metallic ions. The color-forming indicator is of the type which reacts with the thus formed metal ions to form a distinctive colored compound at the crack locations.

3,652,227

## NITRIC OXIDE ANALYSIS

John N. Harman, III, Placentia, and Radhakrishna M. Neti, Brea, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 15, 1969, Ser. No. 885,007
Int. Cl. B01d 53/34; C01b 21/46; G01n 31/10
U.S. Cl. 23—232 R 24 Claims




Method and apparatus for determining the nitric oxide content of a sample gas stream. The nitric oxide in the gas stream is reacted with an excess amount of ozone so as to completely convert the nitric oxide into nitrogen dioxide. The resulting gas containing nitrogen dioxide and residual ozone is passed through a scrubber which removes the ozone and does not affect the nitrogen dioxide content of the gas. The resulting gas is then analyzed for its $NO_2$ content, which is a function of the nitric oxide content of the sample gas. The method and apparatus may also be utilized for determining the total amount of nitrogen dioxide and nitric oxide in a sample gas. The invention is particularly applicable to the monitoring of air for air pollution control.

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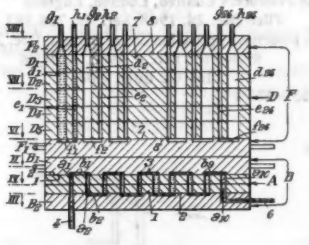
3,652,228

## DEVICE FOR PORTIONING AND TITRATING LIQUID SAMPLES

Claude Bernard, 4, rue Saint Georges, 35, Rennes, France

Filed July 24, 1969, Ser. No. 844,502
Claims priority, application France, July 26, 1968, 160889
Int. Cl. B01l 11/00; G01n 31/16
U.S. Cl. 23—253 R 14 Claims



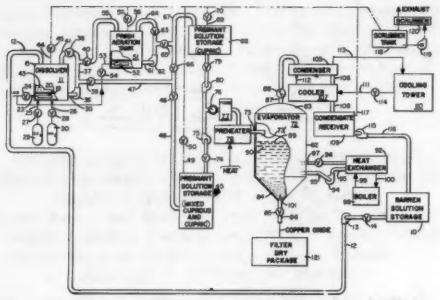
The device is intended to portion a liquid sample into several portions of determined volume. It comprises members that are relatively displaceable from a first relative position to a second relative position. One of these members comprises a series of portion-receiving channels defining the above-mentioned volumes. The other member comprises a first series of channels which put the portion-receiving channels in communication with one another and with the exterior so that they can be filled with the liquid, in the first relative position, and a second series of channels communicating with the portion-receiving channels for collecting the portions retained in these latter channels, in the second relative position.

3,652,229

## APPARATUS FOR PRODUCTION OF METAL OXIDES

Zane L. Burke, 14465 Oak Street, Whittier, Calif.

Filed Mar. 12, 1969, Ser. No. 806,386
Int. Cl. B01j 1/00; C01g 3/02; C22b 3/02
U.S. Cl. 23—260 13 Claims



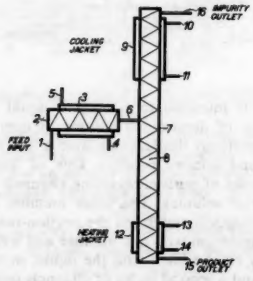
Apparatus for use in a hydrometallurgical system for producing copper or zinc oxide. A closed evaporator tank partially is filled with mild ammonia hydroxide maintained between 214° and 218° F. by recirculation through a heat exchanger external to the evaporator. A pressure of between 5 and 10 p.s.i. is maintained in the evaporator. When a metal-rich ammonia carbonate solution formed by leaching copper or zinc in an oxygenated dissolver tank is injected onto the surface of the ammonia hydroxide, a rapid reaction takes place, causing precipitation of the desired oxide and evaporation of $NH_3$, $CO_2$ and water. The precipitated oxides may be removed either continuously or in batches from the evaporator. The evaporated gases are condensed and reused in the leach solution. Efficient oxygenation in the dissolver is achieved using a novel aerator comprising a hollow carbon rod.

3,652,230

## CRYSTALLIZATION APPARATUS WITH VERTICAL HELICAL CONVEYOR

Geoffrey William Girling, Hempstead, England, assignor to Benzole Producers Limited, London, England

Filed Dec. 24, 1968, Ser. No. 786,582
Claims priority, application Great Britain, Dec. 29, 1967, 59,008/67; Feb. 8, 1968, 6,208/68
Int. Cl. B01d 9/04
U.S. Cl. 23—273 F 2 Claims



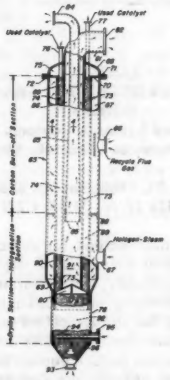

Organic and inorganic substances are purified by a crystallization technique in which the initial material is first converted into a crystal-liquid slurry (by pre-melting and then cooling solid charging stock and pre-cooling liquid charging stock) and then feeding the slurry into a vertical crystallizing column wherein a temperature gradient is set up between the cooled upper end and the lower end thereof. A helical conveyor causes the crystals to descend in a spiral path to the bottom of the column in countercurrent to an upward flow of displaced liquid, where they are melted and drawn off as purified material. The technique results in an increased throughput through the column without affecting the purity of the product.

3,652,231

## RECONDITIONING SYSTEM FOR MOVING COLUMN OF REFORMING CATALYST

Arthur R. Greenwood, Niles, and Kenneth D. Vesely, Arlington Heights, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Sept. 25, 1969, Ser. No. 860,904
Int. Cl. B01j 9/08, 11/18, 11/80
U.S. Cl. 23—288 G 10 Claims




A system for effecting the reconditioning of catalyst particles used in the reforming of a hydrocarbon stream which provides a vertically elongated confined chamber that will have the particles flow down between screens of perforated plates in a descending column through a carbon burn-off section and a halogenation section. A preferred design provides for an annular-form column of particles with gas flows being out-to-in laterally through the column and, in addition, incorporates a drying section in the lower portion of the chamber. An overall system with a preferred design also combines means for scrubbing the flue gas stream from the burn-off section and returning it to the chamber and, in addition, combines means for continuously recycling a steam-halogen-air stream through the halogenation section.

3,652,232

## METHOD FOR THE PURIFICATION OF HYDROUS ALUMINUM CHLORIDE

Richard W. Voight, Franklin, N.J., and David S. Hoffenberg, Bethlehem, Pa., assignors to Pearsall Corporation, Phillipsburg, N.J.

Continuation of application Ser. No. 717,021, Mar. 28, 1968, now abandoned. This application June 25, 1970, Ser. No. 56,059
Int. Cl. C01f 7/62; B01d 9/02
U.S. Cl. 23—300 1 Claim

In a method for the purification of hydrous aluminum chloride to remove iron, copper and other undesirable trace metals, and any organic contaminants present, hydrous aluminum chloride is precipitated from its aqueous solution by passing hydrogen chloride or a gas containing hydrogen

chloride into the solution. The precipitate of hydrous aluminum chloride, which is separated from the aqueous solution by filtration is then washed, and either dried to produce pure aluminum chloride hexahydrate crystals, or redissolved to produce aqueous solutions of purified hydrous aluminum chloride of any desired strength. The iron, copper, and other undesirable trace metals and organic contaminants remain in the mother liquor.

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3,652,233

## METHOD OF IMPROVING RECOVERY OF NEPTUNIUM IN THE PUREX PROCESS

John L. Swanson, Richland, Wash., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 29, 1969, Ser. No. 888,831
Int. Cl. B01d *11/00*
U.S. Cl. 23—341 6 Claims

The recovery of neptunium values from the Purex Process for reprocessing irradiated nuclear reactor fuel is improved by adding a rate-accelerating material to increase the rate of oxidation of the neptunium in the nitric acid solution in the first extraction column. The rate-accelerating material is formed by adding 1-nitropropane to a sodium hydroxide solution to form the aci-form of nitropropane, then adding sodium nitrite and acidifying the solution by the addition of nitric acid.

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3,652,234

## SILVERY-TONE MATTE-FINISH FLASH COAT ALLOY PRODUCT

Anthony J. Lamantia, Toronto, Ohio, assignor to National Steel Corporation

Original application Mar. 21, 1967, Ser. No. 624,699, now abandoned. Divided and this application May 20, 1969, Ser. No. 842,059
Int. Cl. B21c *27/00*
U.S. Cl. 29—183.5 3 Claims

Matte-finish tinplated flat rolled steel product having about 0.01 to 0.03 pound per base box inner coating of tin-iron alloy and an outer coating of matte-finish tin sufficient to bring the total coating weight to about 0.1 pound per base box, produced by applying a flash coating of tin to the steel product, alloying the flash coating of tin with the base metal, and electroplating a matte-finish layer of free tin to the alloy coated product.

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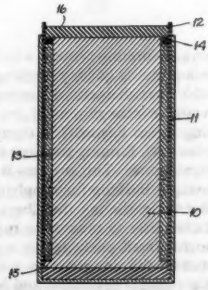
3,652,235

## COMPOSITE METAL ARTICLES

Charles E. Manilla; Harold H. Honaker, both of Huntington, and David O. Gothard, Ona, all of W. Va., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Apr. 14, 1967, Ser. No. 630,987
Int. Cl. B32b *15/00*
U.S. Cl. 29—194 6 Claims




Production of clad stock, e.g., bar, tubing, pipe, etc., wherein the cladding is prepared by pressing metal powders to desired form, the green form is sintered and coextruded hot with the core or basis material. Highly corrosion resistant cladding metals can be applied to core or basis materials of iron-group metals including common structural materials and high recovery of the cladding material is obtained. Clad tubes having a cladding of 50 percent nickel-50 percent chromium alloy on substrates of steels, nickel alloys, including nickel-chronium alloys, etc., can readily be produced for use in applications requiring resistance to severe corrosive conditions at various temperatures.

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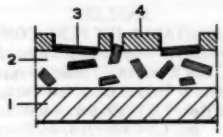
3,652,236

## AN ARTICLE HAVING A LAYER CONTAINING NONCONDUCTIVE ORGANIC FIBERS AND METHOD OF PRODUCING

Jules Marie Odekerken, Vught, Netherlands, assignor to N. V. Research Holland, Engelsweg, Hertogenbosch, Netherlands

Filed Oct. 23, 1965, Ser. No. 503,659
Int. Cl. B32b *15/00*
U.S. Cl. 29—195 P 18 Claims




This invention pertains to a composite layered article and to a method for producing the article. The article consists of a body having an electrically conductive layer containing nonconductive organic fibers and a layer of chromium exterior to the fiber containing layer. There may be a metal layer intermediate the body and the organic fiber containing layer. The layers may be deposited electrolytically.

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3,652,237

## COMPOSITE BRAZING ALLOY OF TITANIUM, COPPER AND NICKEL

Howard Mizuhara, San Mateo, Calif., assignor to Western Gold & Platinum Company

Original application Mar. 27, 1968, Ser. No. 716,455, now Patent No. 3,561,099. Divided and this application July 28, 1970, Ser. No. 58,918
Int. Cl. B23p *3/06*
U.S. Cl. 29—198 2 Claims

A malleable composite product comprising at least two malleable metals in proportions that form brittle alloys with the metals arranged in a pair of overlapping outer layers and at least one inner layer. The outer layers are hermetically sealed to each other around the inner layer(s) and the cross-sectional weight ratio of metals is constant across the entire product.

3,652,238

## ANTI-STATIC FUEL COMPOSITION

Jerzy J. Bialy, Lagrangeville; William R. Siegart, Poughkeepsie, both of N.Y.; William D. Blackley, Lake Elmo, Minn., and Harry Chafetz, Poughkeepsie, N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 873,706, Nov. 3, 1969, now abandoned. This application Aug. 6, 1970, Ser. No. 61,796

Int. Cl. C10l 1/20, 1/22

U.S. Cl. 44—62 11 Claims

Antistatic fuel composition comprising a mixture of hydrocarbons in the gasoline, kerosene and/or furnace oil boiling ranges and a minor amount of a reaction product of an aliphatic monoamine having the formula $RNH_2$ in which R is an aliphatic radical having from eight to 20 carbon atoms and either a fluorinated polystyrene having the empirical formula:

$(C_{16}H_3F_{25})_x$ in which $x$ is an average integer between 3 to 5, or a fluorinated polypropylene having the empirical formula:

$(C_3HF_5)_x$ in which $x$ has a value from 20 to 40, and a method for preparing the above-noted aliphatic monoamine derivatives.

3,652,239

## THERMALLY STABLE JET FUEL COMPOSITION

William M. Sweeney, Wappingers Falls; Jerzy J. Bialy, Lagrangeville, and Kenneth L. Dille, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 17, 1969, Ser. No. 877,487

Int. Cl. C10l 1/18, 1/22

U.S. Cl. 44—63 9 Claims

Thermally stable turbine or jet fuel composition containing in combination an ethylene $C_3$ to $C_4$ olefin-diene terpolymer/maleic anhydride-alkylamine reaction product and an aldehyde-amine condensation product and a method of operating a turbine engine on said fuel composition.

3,652,240

## DETERGENT MOTOR FUEL COMPOSITION

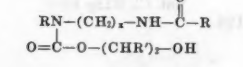
Peter Dorn, Lagrangeville, and Kenneth L. Dille, Wappingers Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 26, 1970, Ser. No. 23,026

Int. Cl. C10l 1/18, 1/22

U.S. Cl. 44—66 3 Claims

Detergent motor fuel composition containing a carbamate represented by the formula:



in which R is a hydrocarbyl radical having from about 12 to 20 carbon atoms and R′ is hydrogen or an alkyl radical having from one to two carbon atoms and $x$ has a value from 2 to 4.

3,652,241

## THERMALLY STABLE FUEL COMPOSITION

Jerzy J. Bialy, and Peter Dorn, both of Lagrangeville, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed May 15, 1970, Ser. No. 37,914

Int. Cl. C10l 1/18, 1/22

U.S. Cl. 44—71 4 Claims

Thermally stable light distillate turbine fuel composition containing 1) a substituted carbamate and 2) an aldehyde-amine condensation product, and a method for operating a turbine engine.

3,652,242

## LIQUID HYDROCARBON FUELS CONTAINING ALKYLAMINE SALTS

Harry J. Andress, Jr., and Julius Capowski, both of Pitman, N.J., assignors to Mobil Oil Corporation

Original application Sept. 11, 1964, Ser. No. 395,933, now abandoned. Divided and this application Feb. 2, 1970, Ser. No. 12,502

Int. Cl. C10l 1/26

U.S. Cl. 44—71 7 Claims

Liquid hydrocarbon fuels are provided which contain, as stabilizing agents, neutral primary alkylamine salts of an alkyl phosphoric acid ester having from two to eight phosphorous atoms, an acid number from about 200 to about 750 and from one to 12 carbon atoms per alkyl group, wherein the primary alkylamine comprises a mixture of branched chain amines having from about eight to about 18 carbon atoms and having the primary amine groups attached to a tertiary carbon atom.

3,652,243

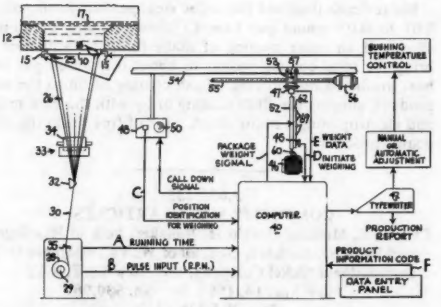
## METHOD AND APPARATUS FOR CONTROLLING THE DIAMETER OF GLASS FIBERS

Thomas H. Jensen, Murrysville, Pa., and Howard M. Bennett, Lexington, N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of application Ser. No. 702,331, Feb. 1, 1968, now abandoned. This application Aug. 26, 1970, Ser. No. 67,260

Int. Cl. C03b 37

U.S. Cl. 65—2 10 Claims



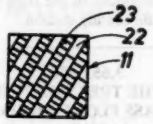

A glass fiber strand forming process which employs a computer to monitor a plurality of fiber forming positions and indicate whether the fiber diameter is correct and whether or not a process variable change should be made before the next fiber forming run is begun. The computer also gives a signal to categorize each forming package according to a plurality of weight categories. This process is accomplished by an apparatus having a bushing for supplying molten streams of glass, a winder for gathering the fibers which supplies a pulse input to a computer to record the running time, a conveyor to transport formed packages to a weight scale. The scale is connected to the computer to send a weight signal thereto whereas a signal is generated and is sent to the bushing to control the temperature of the bushing and the diameter of the forming fibers.

3,652,244

## CHEMICAL TREATMENTS FOR MODIFYING PHYSICAL PROPERTIES OF VARIOUS MATERIALS

Emile Plumat, Gilly, Belgium, assignor to Glaverbel S.A., Watermael Boitsfort, Belgium

Filed Apr. 25, 1968, Ser. No. 723,981
Claims priority, application Luxembourg, Apr. 27, 1967, 53547; Great Britain, Feb. 27, 1968, 9,493/68
Int. Cl. C03c *15/00, 17/00*
U.S. Cl. 65—30 6 Claims



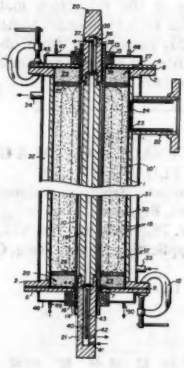

Method and apparatus for chemically treating glass, e.g., chemical tempering, wherein different areas of the glass are subjected to different treatment. For example, certain areas may be subjected to a stronger treatment than others to provide different areas of the glass with different characteristics.

3,652,245

## FURNACE FOR MAKING FUSED QUARTZ HOLLOW SLUGS

Lothar Jung, Millington, N.J., assignor to Amersil Inc., Hillside, N.J.

Filed Sept. 22, 1970, Ser. No. 74,425
Int. Cl. C03b *5/22, 23/20*
U.S. Cl. 65—157 9 Claims



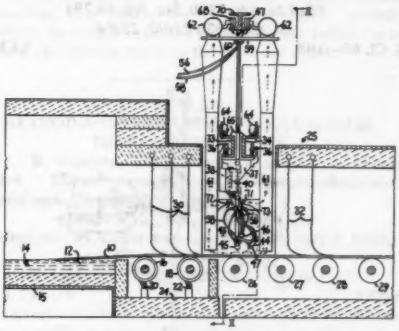
A furnace for making fused quartz hollow slugs comprising a cylindrical tubular housing having closure means at both ends, a quartz tube mounted coaxially in the housing in spaced relationship with the housing, the tube passing through the closure means in vacuum-tight relationship therewith and forming an annular charge chamber between the quartz tube and the wall of the housing, an elongated electrical resistor heating means mounted in the quartz tube in spaced relationship and coaxially of the quartz tube, the inner space of the quartz tube being open to either atmospheric air pressure or to an atmosphere of controlled pressure and chemical composition suitably applied, and vacuum means communicating with the charge chamber for vacuumizing the charge chamber.

3,652,246

## APPARATUS FOR COATING HOT GLASS

Joseph E. Michelotti, and Vern A. Henery, both of Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 27, 1969, Ser. No. 869,644
Int. Cl. C03b *18/02*
U.S. Cl. 65—181 10 Claims



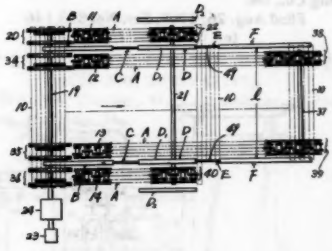
Apparatus for coating a surface of a newly formed ribbon of float glass immediately after delivering the ribbon from a bath containing molten tin, while the glass surface is at a temperature sufficiently high to pyrolize said composition to form a metal oxide coating thereon of sufficient thickness to provide the coated glass with desired properties, such as reducing the transmission of certain wave lengths of light in one or more desired wavelength bands through the coated sheet or making the coated sheet electroconductive.

3,652,247

## METHOD AND APPARATUS FOR SHAPING THE ENDS OF GLASS TUBE

Toshio Nakayama, and Shoichi Horikawa, both of Otu-shi, Japan, assignors to Nippon Electric Glass Company Limited, Tokyo, Japan

Filed Oct. 6, 1969, Ser. No. 863,846
Claims priority, application Japan, Dec. 11, 1968, 43/90649
Int. Cl. C03b *23/04, 33/08*
U.S. Cl. 65—104 7 Claims



Glass tubes are transferred while being rotated by means of roller groups arranged in a plurality of rows. Intermediate between the ends of the transfer path, on both sides of the roller groups and in intermediate positions corresponding to the portions to be treated of the glass tube close to both ends thereof, there are correspondingly provided burners, a shaping rail for squeeze shaping the tube cooling pipes, a cutter burner and thin circular cutting plate for cutting the tube at

the middle of the shaped portion and burners for smoothing the cut surfaces and for successively cooling those surfaces with gentle flames.

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**3,652,248**

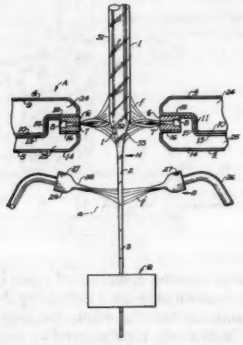
**PROCESS FOR REDRAWING SILICA GLASS RODS**

**Ted A. Loxley, Mentor; John M. Webb, Chagrin Falls, and Walter G. Barber, North Perry, all of Ohio, assignors to Edward J. Mellen, Jr., East Cleveland, Ohio**

**Filed June 9, 1970, Ser. No. 44,791**

**Int. Cl. C03b** *21/00, 23/04*

**U.S. Cl. 65—108** **9 Claims**



A process of redrawing a hollow quartz glass rod to close tolerances comprising feeding the rod vertically between motor-driven feed rolls, directing flames radially inwardly against the periphery of the rod to heat the glass to a drawing temperature above 3,000° F., and maintaining a tension on the rod to draw it and reduce its diameter at least 70 percent, characterized in that jets of cooling air are directed radially inwardly against the periphery of the heated glass about 1 to about 2 inches below the flame and above the zone of constant diameter to reduce the length of the tapered neck substantially and thereby provide better dimensional control.

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**3,652,249**

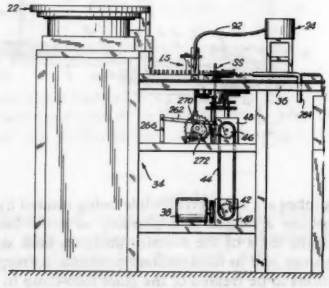
**APPARATUS FOR MANUFACUTRING ASSEMBLIES OF CLOSED GLASS TUBES EACH WITH A PELLET THEREIN**

**James C. White, Rutherford, N.J., assignor to Propper Manufacturing Co., Inc.**

**Filed Aug. 26, 1969, Ser. No. 853,146**

**Int. Cl. C03b** *23/18*

**U.S. Cl. 65—156** **4 Claims**



A method and apparatus for manufacturing assemblies of closed tubes each with a pellet therein. The tubes initially have only one closed end and an opposed open end. These tubes are positioned in an upright attitude with open ends up, and a pellet is deposited in each tube by a pellet-depositing means at a loading station where each tube is positioned in its upright position by a positioning means. A feeding chain is intermittently driven to feed the tubes in a stepwise manner to and from the loading station where a dispenser sequentially dispenses a pellet into each tube. Beyond the loading station the successive tube, are preheated at the region of their upper open ends, and then they are sealed at these preheated upper open ends. The sealing takes place at a sealing station where each tube is rotated about its axis while its preheated upper end is held stationary to separate the preheated upper end from the remainder of the tube which becomes automatically closed at the sealing station.

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**3,652,250**

**APPARATUS FOR THE TREATMENT OR PRODUCTION OF FLAT GLASS FLOATING ON A LIQUID**

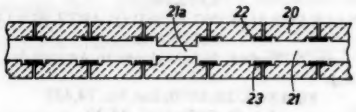
**Edgard Brichard, Jumet, Belgium, assignor to Glaverbel, Watermael-Boitsfort, Belgium**

**Filed Oct. 3, 1969, Ser. No. 863,600**

**Claims priority, application Great Britain, Sept. 5, 1969, 44,044/69**

**Int. Cl. C03b** *18/02*

**U.S. Cl. 65—182 R** **5 Claims**




In the production 26 treatment of flat glass floating on a liquid contained in a tank formed of refractory materials and having a passageway in the refractory material extending from one region of the tank to another some of the liquid is circulated through this passageway from one region of the tank to another in order to control or regulate the distribution of heat within the tank liquid.

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**3,652,251**

**REFRACTORY FURNACE WALL OF A GLASS SHEET FLOATING TANK**

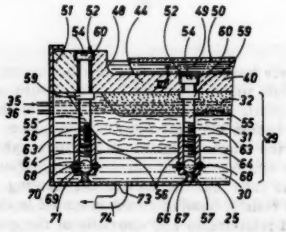
**Edgard Brichard, Jumet, Belgium, assignor to Glaverbel, Watermael-Boitsfort, Belgium**

**Filed Oct. 29, 1969, Ser. No. 872,317**

**Claims priority, application Luxembourg, Oct. 30, 1968, 57195**

**Int. Cl. C03b** *18/02*

**U.S. Cl. 65—182 R** **12 Claims**



A refractory furnace wall has a refractory member spaced from the inner side of a wall member so as to define an intermediate space therebetween. The wall and refractory mem-

bers are interconnected by a connector member which maintains the members in spaced relationship and which may be adjusted to vary the distance between the wall and refractory members.

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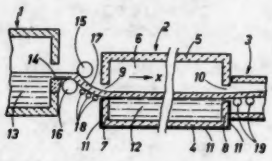
**3,652,252**

**TANK FURNACE FOR THE TREATMENT OF GLASS BY THE FLOAT PROCESS**

**Gustave Javaux, Brussels, Belgium, assignor to Glaverbel, Watermael-Boitsfort, Belgium**

**Filed Oct. 3, 1969, Ser. No. 863,517**
**Claims priority, application Great Britain, Sept. 5, 1969, 44,043/69**
**Int. Cl. C03b** *18/02*
**U.S. Cl. 65—182 R** **7 Claims**



A furnace for the treatment of glass has a tank of refractory material containing a bath of molten material upon which the glass is floated. The refractory material has a property of releasing a vitreous phase lighter than the molten material at operating temperatures of the furnace. Metallic screen means comprising a plurality of spaced or overlapping slid metal plates which may be of tungsten or tungsten alloys or positioned between the refractory material and the upper surface of the bath to prevent the vitreous phase from reaching this surface of the bath.

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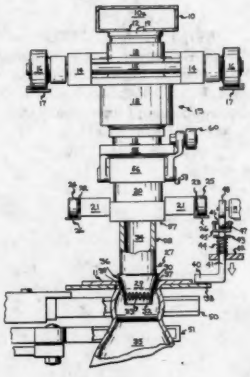
**3,652,253**

**PRESSURIZER NOZZLE**

**Owen M. Small, Toledo, Ohio, assignor to Owens-Illinois, Inc.**

**Filed Jan. 16, 1970, Ser. No. 3,328**
**Int. Cl. C03b** *5/32, 9/14*
**U.S. Cl. 65—184** **12 Claims**



This invention relates to a nozzle structure for use in a pressurizer machine in glass forming. The pressurizer machine operates to insert a pipe or nozzle into the opening of a glass ribbon and newly formed glass article supported on an apertured orifice plate of a ribbon glass forming machine. Just prior to crack-off of the article from the ribbon in or near the aperture of the plate, the nozzle is inserted below the crack-off line of the glass ribbon and air is emitted in the article to flow out of the mouth opening. Any chips or loose particles of glass as may result at crack-off are carried by the air flow out of the mouth and away from the article. The nozzle structure includes: (1) a frustro conical side wall for baffling or directing air flow upwardly and radially, (2) regulating volume and pressure by the nozzle openings in proportioning their area to the supply pipe, (3) inclining these openings in a 30°–60° inclination to the axis of the nozzle in directing air emission, and (4) providing a carrier-actuator for moving the nozzle—a pressurizer head assembly—whereby the nozzle is moved into the article below the orifice plate elevation in applying the air in the article.

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**3,652,254**

**METHOD AND PLANT FOR EFFECTING MASS TRANSFER PROCESSES**

**Knud C. B. Knudsen, Holte, Denmark, assignor to Aktieselskabet Dansk Svovlsyre-og Superphosphat-Fabrik, Copenhagen, Denmark**

**Filed May 4, 1970, Ser. No. 34,230**
**Claims priority, application Great Britain, May 9, 1969, 23,784/69**
**Int. Cl. C05b** *17/00;* **C01b** *25/28;* **C02b** *1/42*
**U.S. Cl. 71—34** **1 Claim**

The invention relates to a method and a plant for effecting a mass transfer between a liquid and a granular solid, in which the solid is in a fixed bed arrangement in a loop circuit, the liquid being sent to part of said fixed bed through inlets and outlets which are moved forward stepwise upon exhaustion of the solid, the process liquid being replaced, in the exhausted part, by a stripping liquid, the inlet and the outlet of which are also moved stepwise forward as the transfer zone is moved.

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**3,652,255**

**AGENTS FOR RETARDING THE GROWTH OF PLANTS AND CHANGING THEIR HABIT**

**Hans Osieka; Karl-Heinz Koenig, both of Ludwigshafen (Rhine); Johann Jung, Limburgehof, Pfalz, and Harry Distler, Ludwigshafen (Rhine), all of Germany, assignors to Badische Anilin-& Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany**

**Original application May 25, 1967, Ser. No. 641,163, now abandoned. Divided and this application Sept. 3, 1969, Ser. No. 870,952**
**Int. Cl. A01n**
**U.S. Cl. 71—76** **5 Claims**

Sulfonium salts and a method of retarding plant growth with said sulfonium salts.

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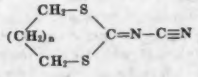
**3,652,256**

**CYCLIC ESTERS OF CYANODITHIOIMIDOCARBONIC ACID AND DERIVATIVES**

**John J. D'Amico, Dunbar, W. Va., assignor to Monsanto Company, St. Louis, Mo.**

**Filed June 20, 1966, Ser. No. 558,593**
**Int. Cl. A01n** *9/12;* **C07d** *71/00, 73/00*
**U.S. Cl. 71—90** **7 Claims**

New compounds of the formula



where *n* is 0 to 8, inclusive, and derivatives thereof are biological toxicants, rubber accelerators and useful intermediates.

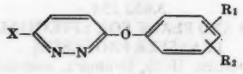
3,652,257

## FLUOROPHENOXY-PYRIDAZINES AS SELECTIVE HERBICIDES

Teruomi Jojima, Tokyo, Japan, assignor to Sankyo Company Limited, Tokyo, Japan

Filed Feb. 24, 1969, Ser. No. 801,745
Claims priority, application Japan, Feb. 28, 1968, 43/12727
Int. Cl. A01n 9/22
U.S. Cl. 71—92 3 Claims

Herbicidal composition which comprises as an active ingredient of a 3-phenoxypyridazine compound having the formula



wherein X is hydrogen atom or chlorine atom, $R_1$ is trifluoromethyl group or fluorine atom and $R_2$ is hydrogen atom or chlorine atom, provided that, where X is hydrogen atom, $R_1$ is trifluoromethyl group or fluorine atom and $R_2$ is hydrogen atom or chlorine atom and, where X chlorine atom, $R_1$ is trifluoromethyl group and $R_2$ is hydrogen atom or chlorine atom and an agriculturally-acceptable carrier. Method for inhibiting the growth of undesirable plants which comprises applying to the locus to be protected a herbicidally effective amount of said 3-phenoxypyridazine compound.

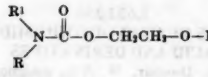
3,652,258

## METHOD OF CONTROLLING WEEDS WITH PHENOXYETHYL CARBAMATES

Llewellyn W. Francher, 22 Valley View Drive, Orinda, Calif.

Continuation of application Ser. No. 798,233, Sept. 19, 1968, now abandoned, which is a division of application Ser. No. 604,136, Dec. 13, 1966, now Patent No. 3,439,021, which is a continuation-in-part of application Ser. No. 367,879, May 15, 1964, now abandoned. This application Oct. 27, 1969, Ser. No. 869,961
Int. Cl. A01n 9/24
U.S. Cl. 71—106 7 Claims

The compounds of the class halo-substituted phenyl oxyethyl esters of N-alkyl carbamic acids having the general formula



wherein R and $R^1$ are selected from the group consisting of hydrogen, lower alkyl having from one to six carbon atoms, inclusive, and lower alkenyl having from two to six carbon atoms, inclusive, at least one of R and $R^1$ is a group other than hydrogen; and $R^2$ is selected from the group consisting of nuclearly substituted phenyl, wherein said substituents are from one to five halogens, inclusive, especially chlorine; for example, 2,4-dichlorophenoxyethyl-N-methyl carbamate and 2,4,5-trichlorophenoxyethyl-N,N-di-n-propyl carbamate.

The compounds of the class are useful as preemergence and post-emergence herbicides. The compounds can be prepared by condensing a halophenyl oxyethanol and an alkyl isocyanate or condensing a halophenyl oxyethanol with an N,N-dialkyl carbamyl chloride.

3,652,259

## SPHERICAL POWDERS

Walter V. Knopp, Wyckoff, N.J., assignor to Olin Mathieson Chemical Corp.

Continuation-in-part of application Ser. No. 577,840, Sept. 8, 1966, now Patent No. 3,434,831. This application May 14, 1968, Ser. No. 728,923. The portion of the term of this patent subsequent to Mar. 25, 1986, has been disclaimed.
Int. Cl. B22f 9/00; B29c 23/00
U.S. Cl. 75—0.5 B 5 Claims

The instant disclosure teaches an improved process for obtaining dense, spherical, metal particles characterized by coating the starting material with a weld-preventing material and heating the coated particles in a protective atmosphere.

3,652,260

## METHOD OF PREPARING METAL CONTAINING PELLETS FROM BLAST FURNACE DUST AND CONVERTER DUST

Masutaro Azami, 3-27 Zaimakuza, 5-chome, Kamakura, Japan

Filed Feb. 13, 1970, Ser. No. 11,116
Claims priority, application Japan, Feb. 19, 1969, 44/11771
Int. Cl. C21b 1/10
U.S. Cl. 75—3 10 Claims

Blast furnace dust and converter dust are mixed with each other and then formed into green pellets containing 7 to 20 percent by weight of carbon. These pellets, after being dried at a temperature below 250° C., are charged into a rotary reducing furnace, in which the pellets are reduced by means of the carbon component contained therein.

3,652,261

## IRON POWDER INFILTRANT

Pierre W. Taubenblat, Somerset, N.J., assignor to American Metal Climax, Inc., New York, N.Y.

Filed June 25, 1969, Ser. No. 836,569
Int. Cl. B22f 3/26; C22c 1/04
U.S. Cl. 75—0.5 R 10 Claims

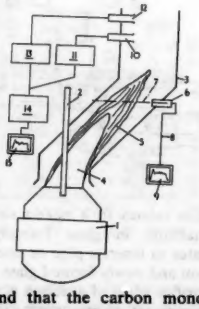
Infiltrant and process for using same for impregnating iron and iron base alloy powder compacts, said infiltrant being an atomized cupreous alloy powder composition containing at least 85 percent by weight of copper and having iron, manganese, aluminum and nickel as essential alloying components thereof. Carbon and lubricant may be incorporated therein as optional ingredients.

3,652,262

## REFINING OF PIG IRON

Etienne Marie Denis, Grivegnee, Belgium, assignor to Centre National De Recherches Metallurgiques, Brussels, Belgium

Filed Aug. 17, 1967, Ser. No. 661,401
Claims priority, application Luxembourg, Aug. 23, 1966, 51,810; 51,811
Int. Cl. C21c 5/32
U.S. Cl. 75—60 4 Claims



It has been found that the carbon monoxide in gases emerging from a converter tends to burn to carbon dioxide

by contact with oxygen in the surrounding air and that the flame so produced has an intensity which is closely related to the rate of flow of carbon monoxide, and hence to the rate of decarbonization of the iron. This is made use of in the invention by controlling the flow of gases emerging from the converter spout and measuring, generally continuously, the intensity of the flame produced when placed in contact with the surrounding air in a hood.

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3,652,263

## DIRECT PRODUCTION METHOD FOR MEDIUM- AND LOW-CARBON FERROMANGANESE

**Hisao Shindo, Tokyo; Yoshishige Nagoya, Hachinoe-shi; Takashi Takeuchi, Hachinoe-shi, and Kosuke Murai, Hachinoe-shi, all of Japan, assignors to Taiheiyo Kinzoku Kabushiki Kaisha Co., Ltd., Tokyo, Japan**

**Filed Apr. 30, 1968, Ser. No. 725,532**

**Int. Cl. C22b** *1/00, 9/10, 47/00*

**U.S. Cl. 75—80** **9 Claims**

A production method for medium- and low- carbon ferromanganese directly from silico-manganese, which method comprises charging molten silico-manganese, heated manganese ore and slagging materials (or, if necessary, with an added reducing agent) into a reaction vessel, giving a horizontal eccentric circular motion to said reaction vessel, and oxidizing and removing silicon as well as reducing manganese.

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3,652,264

## RECOVERY OF ZINC VALUES FROM ZINC PLANT RESIDUE

**Fernand Jacques Joseph Bodson, Angleur-Liege, Belgium, assignor to Societe des Mines et Fonderies de Zinc de La Vieille Montagne, S.A., Angleur-Liege, Belgium**

**Filed Jan. 13, 1969, Ser. No. 790,835**

**Claims priority, application Belgium, Nov. 20, 1968, D41,993**

**Int. Cl. C22b** *19/22*

**U.S. Cl. 75—101** **8 Claims**

In a process of recovering metal values from leaching residues of zinc-bearing materials such as the leaching residues of roasted zinc concentrate, comprising subjecting said leaching residues to a subsequent leaching with a solution of dilute sulphuric acid for dissolving the zinc, adding a sulphur-bearing ore to said solution, separating a sulphurous residue from said solution, oxidizing said solution and precipitating the therein contained iron by using an oxidizing agent and adding a neutralizing agent containing zinc oxide.

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3,652,265

## RECOVERY OF METAL VALUES FROM NICKEL-COPPER MATTES

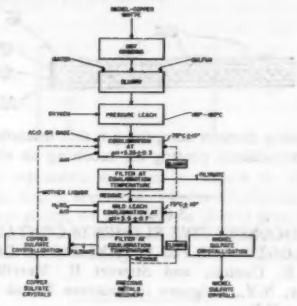
**John F. Marschik, Summit, and Werner J. Cernoch, Ridgefield, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation**

**Filed Nov. 28, 1969, Ser. No. 880,812**

**Int. Cl. C01g** *1/10*; **C22b** *3/00*

**U.S. Cl. 75—117** **12 Claims**

A process for recovering nonferrous metal values from nickel-copper mattes includes the selective separation of nickel from the mattes by oxidative pressure leach of the matte and equilibration of the pressure leached material to a pH of preferably 5.35 ± 0.3. Thereafter copper is leached from the resultant nickel depleted residue under relatively



mild conditions. Precious metals are recovered from the mild leach residue.

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3,652,266

## BE-SI ALLOY FOR STRUCTURAL PARTS

**Albert R. Kaufmann, Lexington, Mass., assignor to Whittaker Corporation, Nuclear Metals Div., West Concord, Mass.**

**Filed Oct. 29, 1968, Ser. No. 771,425**

**Int. Cl. C22c** *25/00*

**U.S. Cl. 75—134 S** **22 Claims**

Parts formed from a beryllium-silicon alloy containing approximately 62 weight percent silicon are readily castable without the formation of large porosities or shrinkage cavities on cooling. They are characterized by a high ratio of elastic modulus to density and a high ratio of thermal conductivity to thermal expansion, are relatively homogeneous and isotropic throughout, and are surprisingly less brittle than either of their component metals. They are especially useful as mirror substrates.

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3,652,267

## CARBON STEELS AND ALLOY STEELS FOR COLD FORGING

**Tetsuro Ito, and Azuma Hiki, both of Nagoya, Aichi, Japan, assignors to Daido Seiko Kabushiki Kaisha, Aichi Prefecture, Japan**

**Filed Sept. 23, 1968, Ser. No. 761,463**

**Claims priority, application Japan, Oct. 11, 1967, 42/64954**

**Int. Cl. C22c** *39/00*

**U.S. Cl. 75—123 L** **6 Claims**

This invention relates to machine structural carbon steels and alloy steels having an excellent cold forging property. Such a steel can be produced by deoxidizing a carbon steel or an alloy steel with a calcium-silicon alloy and controlling the calcium content thereof.

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3,652,268

## BARRIER COATED ELECTROPHOTOGRAPHIC SHEET SUITABLE FOR LIQUID DEVELOPMENT

**Clifton B. Rowe, Chicago, Ill., assignor to A. B. Dick Company, Chicago, Ill.**

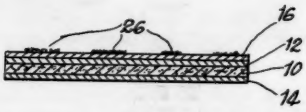
**Filed Mar. 16, 1970, Ser. No. 19,954**

**Int. Cl. G03g** *5/04*

**U.S. Cl. 96—1.5** **23 Claims**

An electrophotographic reproduction process and copy sheet therefor for development of a latent electrostatic image on the copy sheet by a liquid developer wherein the copy sheet comprises a conductive base sheet having a thin barrier coating on each side thereof, the coating comprising a highly dielectric insulating material and a conductor material which

is either a polymeric quaternary ammonium halide or an ammonium salt of an alkyl aryl sulfonate, and one side having a




second coating thereon comprising a thin insulating coating or a photoconductor coating for receiving an electrostatic image.

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**3,652,269**

**PHOTOCONDUCTIVE ELEMENTS CONTAINING HALOGENATED POLYETHYLENE BINDERS**

**Lawrence E. Contois, and Stewart H. Merrill, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Aug. 27, 1968, Ser. No. 755,716**
**Int. Cl. G03g** *5/00;* **C08f** *3/22*
**U.S. Cl. 96—1.5** **20 Claims**

Photoconductive elements containing a photoconductor and a binder comprising polymers of halogenated polyethylenes are described. These elements can be sensitized and charged either negatively or positively.

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**3,652,270**

**RECORDING DEVICES**

**Akio Yamashita, Ikeda-shi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Continuation of application Ser. No. 350,830, Mar. 10, 1964, now abandoned. This application Jan. 10, 1969, Ser. No. 793,222**
**Claims priority, application Japan, Mar. 16, 1963, 38/14538; Apr. 27, 1963, 38/22760; May 2, 1963, 38/23219; May 2, 1963, 38/23220; June 17, 1963, 38/32395; June 21, 1963, 38/32532; Sept. 21, 1963, 38/50994; Sept. 21, 1963, 38/50995; Oct. 25, 1963, 38/57735; Oct. 28, 1963, 38/58709**
**Int. Cl. G03g** *5/04*
**U.S. Cl. 96—1.5** **1 Claim**

A recording device comprising in series a first electrode, a layer containing a dispersed mixture of at least a semiconductor and an electrical insulator having one side contacting said electrode, a solid layer of an electrical insulator contacting the other side of the first mentioned layer, and a second electrode disposed on the other side of the solid insulator layer in electrical contact therewith. The second electrode may be either in direct abutting contact with the solid insulator layer or may act thereon through either a fluorescent phosphor layer or a photoconductive layer. When a voltage is applied between the electrodes, a charge of the same polarity as that of the first electrode is stored in both the layer of the mixture of semiconductor and insulator and in the solid insulator layer.

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**3,652,271**

**PHOTOELECTROSTATIC RECORDING MEMBER**

**Dennis M. Bornarth, Palatine, and Frank Schneidinger, Marengo, both of Ill., assignors to Addressograph-Multigraph Corporation, Mount Prospect, Ill.**

**Continuation-in-part of application Ser. No. 664,958, Sept. 1, 1967, now abandoned. This application Apr. 20, 1970, Ser. No. 30,238**
**Int. Cl. G03g** *5/08*
**U.S. Cl. 96—1.8** **13 Claims**

A photoelectrostatic copy sheet is prepared by using a paper base sheet having a roughness in the range of from 100 to 250 Sheffield units. Bonded to the rough surfaced paper is a photoconductive layer comprising zinc oxide and in another embodiment sub-millimicron sized particles of hydrophobic silica dispersed in a resin binder. The layer conforms to the rough fiber textured surface of the base sheet to provide a finished recording surface having a roughness in the range of from 70 to 250 Sheffield units and a gloss (75°, Gardner) not in excess of 20 percent. This sheet has the appearance, feel and handle of an uncoated piece of paper.

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**3,652,272**

**PHENOXY PHOTOPOLYMER HAVING NO EPOXY GROUPS, AND ARTICLE MADE THEREFROM**

**Daniel C. Thomas, Wheaton, Ill., assignor to Lithoplate, Inc., Covina, Calif.**

**Filed Oct. 31, 1969, Ser. No. 873,085**
**Int. Cl. G03f** *7/02;* **G03c** *1/68, 1/52*
**U.S. Cl. 96—33** **16 Claims**

A photopolymer adapted for use in lithography, photomechanical processes, or other applications, consisting essentially of an actinic light-tanned product of a phenoxy resin of high molecular weight formed in the presence of a sensitizer which is a diazo resin or a chromium compound, such as ammonium bichromate. A photopolymer-yielding system or combination consisting essentially of a phenoxy resin and a sensitizer, which is a diazo resin or chromium compound yielding hexavalent chromium, the resin and sensitizer being in contact with each other. A lithographic plate including such photopolymer or such photopolymer-yielding system or combination. A method of making such photopolymer, comprising subjecting such photopolymer system or combination to treatment with actinic light.

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**3,652,273**

**PROCESS USING POLYVINYL BUTRAL TOPCOAT ON PHOTORESIST LAYER**

**Maung S. Htoo, Poughkeepsie, N.Y., assignor to International Business Machines Corporation**

**Filed Sept. 11, 1967, Ser. No. 666,860**
**Int. Cl. G03c** *5/00*
**U.S. Cl. 96—36** **9 Claims**

An improved process for the formation of photo-resist patterns on substrates by coating the subtrate with a layer of a synthetic resin photo-resist composition, applying a topcoat of vinyl butyral polymer over the photo-resist, exposing the photo-resist to a light pattern through a mask and the transparent topcoat, and removing the photo-resist from the unexposed areas with a conventional predominantly aromatic hydrocarbon developer which also removes the topcoat. The use of the topcoat eliminates scumming of the substrate due to residual insoluble photo-resist in the unexposed areas of the resist layer, and reduces pinholing in the exposed areas.

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**3,652,274**

**PHOTOGRAPHIC ETCHING RESIST AND PREPARATION THEREOF**

**Johan Lodewijk Verelst, Kontich, and Jozef Frans Willems, Wilrijk, both of Belgium, assignors to Gevaert AGFA N.V., Mortsel, Belgium**

**Filed June 10, 1968, Ser. No. 735,582**
**Claims priority, application Great Britain, June 9, 1967, 26,860/67**
**Int. Cl. G03c** *5/00;* **G03f** *7/00*
**U.S. Cl. 96—36.3** **1 Claim**

A printing plate of the type which is prepared by coating a metal supporting surface with a photo-insolubilizable polymer, exposing the coating to a light image, developing the exposed coating by treatment with a liquid dissolving the unexposed areas only of the coating so that the exposed areas remain as a resist layer on the metal surface, and etching the metal surface with the resist layer thereon by means of an aqueous etching liquid therefore, is given increased resistance in the exposed regions to the attack of the etching liquid by incorporating into the developing liquid a hydrophobizing agent which is either an organic compound containing at least one fluorine substituted alkyl group of an organic silane or siloxane compound containing at least one alkyl or aryl group linked to at least one of its silicon atoms, the hydrophobizing agent also containing a reactive group

capable of chemically reacting with the photo-insolubilizable polymer. The polymer preferably includes active hydrogen atoms after insolubilization and preferred chemically active groups in the hydrophobizing agent are acid anhydride, isocyanate, epoxy, and acid chloride groups.

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3,652,275

## HEXAARYLBIIMIDAZOLE BIS (P-DIALKYL-AMINOPHENYL-α,β-UNSATURATED) KETONE COMPOSITIONS

**Martin D. Baum, and Cyrus P. Henry, Jr., both of Wilmington, Del., assignors to E. I du Pont de Nemours and Company, Wilmington, Del.**

**Filed July 9, 1970, Ser. No. 53,686**
**Int. Cl. G03c** *1/68, 1/72, 5/24*
**U.S. Cl. 96—48** **36 Claims**

Compositions comprising a hexaarylbiimidazole and a selected bis(p-aminophenyl-...α,β-unsaturated) ketone and optionally, a leuco dye, a polymerizable monomer or inert components such as binders, solvents and the like are photoactivated in the visible light wavelengths.

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3,652,276

## PHOTOGRAPHIC PHOTOCONDUCTOR SYSTEMS UTILIZING REVERSIBLE REDOX MATERIALS TO IMPROVE LATENT IMAGE LIFE

**Richard F. Bartlett, Burlington, Mass., and Itek Corporation, Lexington, Mass.**

**Continuation-in-part of application Ser. No. 510,977, Dec. 1, 1965, now abandoned. This application July 2, 1969, Ser. No. 838,651**
**Int. Cl. G03c** *5/24*
**U.S. Cl. 96—48 PD** **26 Claims**

A copy medium comprising a support, a photoconductor, and a reversible oxidizing agent is exposed to produce a latent image of improved stability and then, after a time period of at least 30 seconds, contacted with image-forming materials to produce an irreversible image. Optionally, the reversible oxidizing agent may be applied to the copy medium immediately after exposure. An acidified copy medium is especially preferred since the stability of the latent image is much improved.

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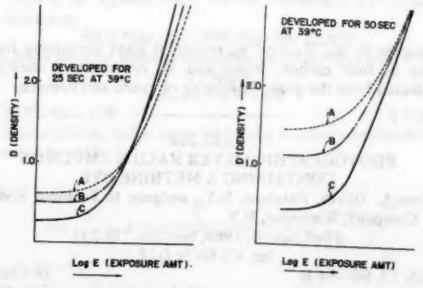
3,652,277

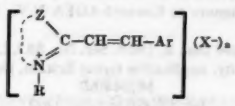
## PROCESSING FOR PHOTOGRAPHIC SILVER HALIDE LIGHT-SENSITIVE ELEMENT

**Hikoharu Hara, and Tadao Hatano, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed July 23, 1969, Ser. No. 844,129**
**Claims priority, application Japan, July 23, 1968, 43/52069**
**Int. Cl. G03c** *5/26, 5/30*
**U.S. Cl. 96—50 PT** **14 Claims**




In a method of processing a photographic silver halide light-sensitive element wherein in the development processing steps of said photographic silver halide light-sensitive element, the improvement comprising processing the exposed photographic silver halide light-sensitive element in the presence of an aldehyde-type hardening agent and a compound represented by the formula




wherein Z represents an atom necessary to complete a heterocyclic ring, R represents a lower alkyl group or a substituted alkyl group, Ar represents a phenyl group or a substituted phenyl group, X represents an acid residual group, and n is 0 or 1, the n being 0 when the compound forms an internal salt.

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3,652,278

## PRE-DEVELOPMENT PROCESS FOR REDUCING FOG IN SILVER HALIDE PHOTOGRAPHIC MATERIALS

**Toshiaki Asano; Kazushige Uenaka, both of Kanagawa, and Tomomasa Usami, Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed July 8, 1968, Ser. No. 743,043**
**Claims priority, application Japan, July 8, 1967, 42/43902**
**Int. Cl. G03c** *5/38, 1/34*
**U.S. Cl. 96—61** **16 Claims**

A method for reducing fog in photographic materials which are to be stored in formaldehyde containing atmospheres whereby a compound capable of reacting with and fixing said formaldehyde is incorporated into the silver halide emulsion of said photographic material. A light-sensitive silver halide photographic material which can be stored in a formaldehyde containing atmosphere without deterioration of photographic properties.

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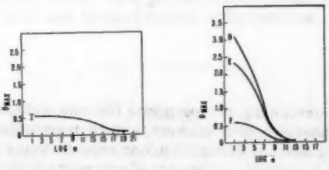
3,652,279

## NITROGEN-CONTAINING DMAX MAINTAINERS FOR USE IN PHOTOSOLUBLE EMULSIONS

**Ralph Kingsley Blake, Westfield, and Joseph De Witt Overman, New Shrewsbury, both of N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed July 18, 1969, Ser. No. 842,864**
**Int. Cl. G03c** *5/24*
**U.S. Cl. 96—64** **8 Claims**



An improved process for forming a silver halide image by selective exposure of a photosoluble silver halide layer and dissolution of the exposed photosoluble silver halide in a silver halide solvent characterized by the presence in either the layer, solvent, or both, of a heterocyclic nitrogen-containing compound which loses a proton to form anions at an elevated pH, e.g., benzotriazoles, naphthotriazoles, 5-nitroimidazoles, and 6-nitroindazole, which compounds enhance the action of mercaptan insolubilizers in photosoluble emulsions. New photosoluble elements for making direct positive images are provided by the invention.

3,652,280

## LIGHT-SENSITIVE SILVER HALIDE EMULSION WITH HIGH RESOLVING POWER

Maurice Hector De Belder, Mechelen; Rene Omer Duville, Edegem; Herman Adelbert Philippaerts, Mortsel; Theofiel Hubert Ghys, Kontich, and Henri Depoorter, Mortsel, all of Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

Filed Dec. 8, 1969, Ser. No. 883,235
Claims priority, application Great Britain, Dec. 11, 1968, 58,844/68
Int. Cl. G03c *5/24, 1/02*
U.S. Cl. 96—64 17 Claims

Lippmann silver halide emulsions comprising a hydrophilic colloid are provided which contain at least one light-absorbing dye that absorbs light of the wavelength used for the exposure of the said emulsions and that is decolorized and/or removed in at least one of the photographic processing liquids, characterized in that the said absorbing dye is present in such an amount that per micron of emulsion layer thickness a density of at least 0.05 and at most 0.14, preferably comprising between 0.08 and 0.12, measured in the spectral region of the exposure light, is obtained. The emulsions have high resolving power and acutance, and are suitable for both reversal processing and negative processing.

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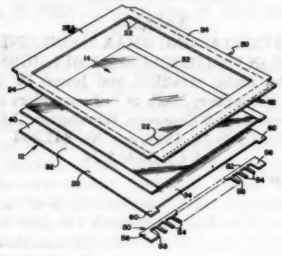
3,652,281

## PHOTOGRAPHIC FILM UNIT

Albert J. Bachelder, Lexington, and Frederick J. Binda, Cambridge, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed July 15, 1968, Ser. No. 744,912
Int. Cl. G03c *1/48*
U.S. Cl. 96—76 11 Claims



A self-developing, photosensitive film unit including a multilayer photosensitive element and a transparent image-recording element laminated to one another during manufacture and a rupturable container of processing liquid attached to the elements at one end for dispensing its liquid contents between the elements, and adapted to be processed by passing the film unit including the container and laminated elements between a pair of pressure-applying members. The film unit is formed by embossing, or attaching spacer strips, to the lateral margins of an elongated strip and then laminating the strip to a second strip by spreading a film-forming agent between the strips, severing the laminated strips to the required length to form sandwiches each comprising laminated photosensitive and image-recording elements, securing a binding around at least two sides of each sandwich and attaching a container of processing liquid to one end of the sandwich.

3,652,282

## PHOTOGRAPHIC FILM UNIT AND METHOD OF MANUFACTURE

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 782,056, Dec. 9, 1968, now Patent No. 3,573,043, dated Mar. 30, 1971, which is a continuation-in-part of application Ser. No. 622,283, Mar. 10, 1967, now Patent No. 3,415,644, dated Dec. 10, 1968.
This application Mar. 6, 1969, Ser. No. 804,942
Int. Cl. G03c *1/48*
U.S. Cl. 96—76 16 Claims

A self-developing, photosensitive film unit including a multilayer photosensitive element and a transparent image-recording element laminated to one another during manufacture and a rupturable container of processing liquid attached to the elements at one end for dispensing its liquid contents between the elements, and adapted to be processed by passing the film unit including the container and laminated elements between a pair of pressure-applying members. The film unit is formed by laminating a photosensitive element to an image-receiving element by applying a layer of a film-forming agent to one of the elements, superposing the elements and distributing a layer of a second film-forming material therebetween to form an adhesive bond that is weaker than the bond between any other layers of said film unit and is adapted to rupture readily during the spreading of a processing liquid between the elements. A binding is secured around at least two sides of the laminate and a container of processing liquid is attached to one edge of the sandwich in position to eject its contents between the elements in response to the application of compressive pressure.

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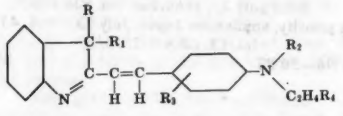
3,652,283

## PHOTOGRAPHIC MATERIALS CONTAINING ANTI-HALATION DYESTUFFS

E. Scudder Mackey, Binghamton, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed May 13, 1968, Ser. No. 728,827
Int. Cl. G03c *1/84, 1/78*
U.S. Cl. 96—84 10 Claims

1. A light-sensitive photographic film element comprising at least one light-sensitive gelatin silver halide emulsion coated on a film base and wherein at least one of the layers comprising said film element contains a water-soluble antihalation dyestuff having a broad absorption in the green region of the spectrum comprising a quaternary ammonium salt of a dyestuff of the following structural formula:



wherein R, $R_1$, $R_2$, and $R_3$ represent alkyl containing from one to four carbon atoms and $R_4$ represents a member selected from the group consisting of cyano and halogen.

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3,652,284

## PHOTOGRAPHIC SILVER HALIDE EMULSION CONTAINING A METHINE DYE

Gene L. Oliver, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 4, 1968, Ser. No. 773,291
Int. Cl. G03c *1/12*
U.S. Cl. 96—84 R 16 Claims

Novel methine dyes are provided which feature a bis(alkylsulfonyl)allylidene (or -pentadienylidene) group or a diaryloxysulfonyl allylidene (or -pentadienylidene group. The dyes are useful as filter dyes in photographic materials. Cer-

tain dyes of the invention function as spectral sensitizers for photographic silver halide emulsions.

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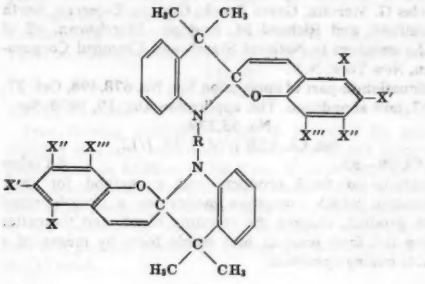
## 3,652,285
## PHOTOCHROMIC-PHOTOPOLYMERIZATION COMPOSITIONS

**Gerard Albert Delzenne, 's-Gravenwezel; Georges Joseph Smets, Heverlee, and Jan Antonius Hoefnagels, Berchem, all of Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium**

**Filed June 23, 1969, Ser. No. 835,727**
**Claims priority, application Great Britain, July 1, 1968, 31,308/68**
**Int. Cl. G03c *1/72, 1/68;* C07d *27/36***
**U.S. Cl. 96—90 PC** **12 Claims**

A photographic material and a process for the formation of non-fading images upon exposure to actinic light comprising a light-sensitive layer formed of a photochromic compound and a photo-hardening polymeric system is described. The photochromic compound has the formula:



wherein:

R represents $-CH_2-CH=CH-CH_2-$, $-(CH_2)_n-$

$-(CH_2)_n-$, $-(CH_2)_n-O-(CH_2)_n-$, $-(CH_2)_n-$, with *n* being an integer from 1 to 8,

X and X″ each represents hydrogen, chlorine, bromine, nitrile, acetyl, carboxy, hydroxy, nitro or methoxy,
X′ represents hydrogen, chlorine, bromine, nitrile, acetyl, carboxy or nitro, and
X′X″ represents hydrogen, chlorine, bromine or nitro.

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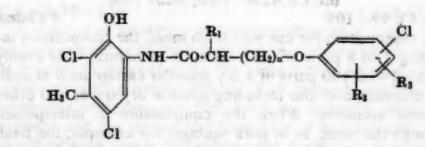
## 3,652,286
## COLOR PHOTOGRAPHIC SILVER HALIDE MULTILAYER MATERIAL CONTAINING CYAN-FORMING COUPLERS

**Hans-Heinrich Credner, Munchen; Hans Glockner, Pullach, and Fritz Nittel, Koln-Stammheim, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany**

**Filed Mar. 26, 1970, Ser. No. 22,998**
**Claims priority, application Germany, Mar. 28, 1969, P 19 15 948.9**
**Int. Cl. G03c *1/40***
**U.S. Cl. 96—100** **1 Claim**

Color photographic material having a color coupler of the general formula



wherein
$R_1$ is H, or a short chain alkyl;
$R_2$ is H, Cl, or a straight or branched chain alkyl;
$R_3$ is a straight or branched chain alkyl and
wherein
the chain carbon atoms of $R_2$ and $R_3$ total to at least eight carbon atoms;
*n* is 0, 1 or 2.

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## 3,652,287
## DIRECT-WRITING EMULSIONS PREPARED BY ADDING AFTER SILVER HALIDE PRECIPITATION IN THE PRESENCE OF LEAD, INSOLUBILIZING ACID ANIONS, AND HETEROCYCLIC NITROGEN COMPOUNDS

**John Howard Bigelow, Rochester, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed Oct. 10, 1969, Ser. No. 865,513**
**Int. Cl. G03c *1/86, 1/10, 1/28***
**U.S. Cl. 96—108** **8 Claims**

Direct-writing silver halide emulsions having higher maximum densities, lower background densities and increased image aging stability are prepared by precipitating silver halides in an acidified aqueous water-permeable colloid medium in the presence of a water-soluble plumbous salt, ripening the resulting emulsion in the presence of excess bromide ions, washing said emulsion to remove the soluble salts resulting from the precipitation of silver halides, adding a heterocyclic nitrogen compound and at least one acid anion capable of forming a substantially insoluble compound with lead ions, digesting the resulting emulsion, adding a halogen acceptor and coating the emulsion on a suitable support. The direct-writing, photodevelopable elements made from the emulsions are useful in oscillographs.

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## 3,652,288
## DYES AND PHOTOGRAPHIC EMULSIONS AND ELEMENTS CONTAINING SAID DYES

**Arthur Fumia, Jr., and Donald W. Heseltine, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed July 20, 1970, Ser. No. 56,653**
**Int. Cl. G03c *1/08, 1/18;* C09b *23/100***
**U.S. Cl. 96—129** **12 Claims**

Novel polymethine cyanine dyes are derived from certain enamines containing a cyclohexene ring having a reactive methylene or methyl substituent thereon. These dyes are spectral sensitizers for photographic silver halide emulsions and sensitize such emulsions up to wavelengths ranging about from 550 to 770 mu. Many of the dyes are useful sensitizers for the red to near infrared regions of the spectrum.

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## 3,652,289
## SILVER HALIDE EMULSIONS AND ELEMENTS COMPRISING TRIMETHINE HEMIOXONAL DYES

**Leslie G.S. Brooker, Rochester; Arthur Fumia, Jr., Hilton, and Donald W. Heseltine, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed July 20, 1970, Ser. No. 56,657**
**Int. Cl. G03c *1/08, 1/18;* C09b *23/100***
**U.S. Cl. 96—139** **12 Claims**

Novel trimethine hemioxonol dyes are provided in which the polymethine chain of the dye includes the 1, 2 and 3 carbon atoms of a 1-cyclohexen-3-ylidene nucleus, the 1-carbon atom of said 1-cyclohexen-3-ylidene nucleus having the nitrogen atom of a tertiary amino group attached thereto. Photographic emulsions and elements are also provided featuring the trimethine hemioxonol dyes of the invention as spectral sensitizers or as filter material. A method for prepar-

ing the trimethine hemioxonol dyes is also provided which comprises heating a quaternary salt of a 3-chlorocyclohex-2-en-1-ylidene compound having substituted on the 1-carbon atom thereof the nitrogen atom of a tertiary amino group, with an acidic compound having an active methylene group of the type used in the preparation of hemioxonol dyes, in the presence of a basic condensing agent.

3,652,290

**BEVERAGES CONTAINING STABILIZED VITAMIN C**

**Paul A. Hammes, Westfield, and Lewis D. Morse, Princeton, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**Filed Aug. 10, 1970, Ser. No. 62,686**

**Int. Cl. A23l** *1/30*

**U.S. Cl. 99—28** **9 Claims**

Vitamin C is stabilized by the addition of 1 to 6 percent histidine or 0.4 to 3 percent glycine or 0.7 to 4 percent methionine based on the weight of the Vitamin C. The stabilized Vitamin C composition is used to fortify beverages. Metabolically available iron can be included within the stabilized Vitamin C composition.

3,652,291

**CITRUS OIL AND OTHER OILS HAVING ENHANCED SPECIFIC GRAVITY, AND USE THEREOF**

**Paul Z. Bedoukian, 40 Ashley Road, Hastings-on-Hudson, N.Y.**

**Continuation-in-part of application Ser. No. 36,439, May 11, 1970. This application Oct. 16, 1970, Ser. No. 81,505**

**Int. Cl. A23l** *1/26;* **A23d** *5/00*

**U.S. Cl. 99—28** **22 Claims**

Polyol benzoate such as glyceryl tribenzoate or propylene glycol dibenzoate or a mixture of the two is combined with an edible oil such as citrus oil or coconut oil to form a mixture having an enhanced specific gravity. The mixture is emulsified by the addition of an aqueous solution of gum arabic. The emulsion is mixed with a beverage base of approximately the same specific gravity.

3,652,292

**INSTANT COFFEE PRODUCT AND A PROCESS FOR ITS MANUFACTURE**

**Heinz Bach; Max Bottger, both of Suchteln, and Heinrich Pabst, Schulberg, all of Germany, assignors to General Foods Corporation, White Plains, N.Y.**

**Filed Mar. 7, 1968, Ser. No. 711,221**

**Claims priority, application Austria, Mar. 8, 1967, A 2209/67; July 31, 1967, A 7104/67; A 7105/67; Nov. 16, 1967, A 10331/67**

**Int. Cl. A23f** *1/08*

**U.S. Cl. 99—71** **27 Claims**

Soluble coffee solids prepared by extraction are mixed in an aqueous medium with wet ground colloidal particles of roast or extracted roast coffee, the latter representing about 3 percent to 40 percent by weight of the total weight of the coffee product. The colloidal particles are stabilized against flocculation by regulation of the pH so as not to exceed a pH of 5.2 and said particles are encased in the dried soluble coffee solids to form an instant coffee product having a fresh-brewed coffee aroma flavor and turbidity. The resultant coffee product may be admixed with additional soluble coffee powder. Drying is performed by conventional methods.

3,652,293

**INSTANT COFFEE COMPOSITIONS EXHIBITING A CRYSTALLINE SHEEN**

**Cesar A. Lombana; Rudolph M. Phillips, both of Springfield Township, Hamilton County, and Richard Gregg, Greenhills, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Continuation-in-part of application Ser. No. 718,569, Apr. 3, 1968, now abandoned. This application Jan. 9, 1969, Ser. No. 797,322**

**Int. Cl. A23f** *1/08*

**U.S. Cl. 99—71** **8 Claims**

Novel instant coffee compositions characterized by an appearance that presents at least one external planar surface exhibiting high sheen, and novel processes for obtaining these instant coffee compositions comprising polishing, and

preferably structuring, thin dense instant coffee flakes by exposing the instant coffee flakes to a jet of moistening fluid comprised of steam or finely atomized water.

3,652,294

**MANUFACTURE OF STARCH-CONTAINING FOOD PRODUCTS**

**Nicholas G. Marotta, Green Brook; Gary A. Zwiercan, North Plainfield, and Richard M. Boettger, Morristown, all of N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.**

**Continuation-in-part of application Ser. No. 678,498, Oct. 27, 1967, now abandoned. This application Aug. 19, 1970, Ser. No. 65,279**

**Int. Cl. A23l** *1/18, 1/10, 1/12*

**U.S. Cl. 99—83** **6 Claims**

Ready-to-eat food products and a method for their preparation which comprises moistening a pregelatinized starch product, shaping the resulting blend, and thereafter putting the food product into edible form by means of a suitable baking operation.

3,652,295

**FERMENTABLE STARCH COMPOSITIONS**

**Saul Rogols, Circleville, and Robert L. High, Canal Winchester, both of Ohio, assignors to A. E. Staley Manufacturing Company**

**Filed Nov. 6, 1968, Ser. No. 773,956**

**Int. Cl. A21d** *2/36, 2/04;* **C12b** *3/06*

**U.S. Cl. 99—91** **14 Claims**

A lipase-altered starch is included in a carbohydrate composition such as a sponge-dough mix to influence favorably the fermentation of such mixes. The lipase-altered starch has a higher fermentation rate than unaltered starch; which rate, in the case of wheat starch, can be further increased by the addition of a calcium salt. The lipase-altered starch has a synergistic effect on fermentation when combined with ammonium persulfate; changes the nature of the sugar material present following fermentation; and, particularly with added ammonium persulfate, improves the grain and texture of bread.

3,652,296

**PROCESS FOR PREPARING SAUSAGE PRODUCT AND PRODUCTS**

**Forrest R. Wilkerson, Jr., and George M. McClancy, both of Charlotte, N.C., assignors to Remac, Inc., Charlotte, N.C.**

**Filed Sept. 4, 1969, Ser. No. 855,373**

**Int. Cl. A22c** *11/00;* **A23b** *1/00*

**U.S. Cl. 99—109** **5 Claims**

A composition for use with fresh meat, the composition including 1 to 8 parts of fresh honey in its natural state evenly blended with 100 parts of a dry granular carrier such as sodium chloride, and also including suitable dry spices and other general additives. When the composition is interspersed through the meat, as in pork sausage, for example, the fresh honey acts to retard spoilage and discoloration of the meat. A process for forming the composition includes preheating the sodium chloride to approximately 120° F., preheating the honey to approximately 90° F., continuously agitating the

preheated sodium chloride while gradually and evenly pouring the honey thereinto, after which the dry spices and other additives may also be blended into this mixture.

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3,652,297

## FLAVOR-STABLE MUSTARD

**Marvin A. Peterson, Park Ridge, and Gerald A. Flint, Chicago, both of Ill., assignors to Beatrice Foods Co., Chicago, Ill.**

**Filed July 10, 1970, Ser. No. 54,002**
**Int. Cl. A23l** *1/22*
**U.S. Cl. 99—140 R** **11 Claims**

A flavor-stable mustard composition is provided by dispersing an encapsulated isothiocyanic acid ester in an oil phase and emulsifying the oil phase in an aqueous medium.

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3,652,298

## METHOD FOR PREPARING FREE FLOWING SUGAR PRODUCTS

**Justin Melvin Mickevicz, Chicago, Ill., assignor to Pro-Col Corporation, Chicago, Ill.**

**Continuation-in-part of application Ser. No. 530,415, Feb. 28, 1966, now abandoned. This application May 7, 1969, Ser. No. 822,691**
**Int. Cl. A23l** *1/26*
**U.S. Cl. 99—141** **3 Claims**

Free flowing powdered sugar is prepared by grinding together in a dry, solid state a white pulverized sugar component and an additive in the form of water insoluble sugar cane cellulose, beet sugar cellulose and/or edible wood cellulose, using proportions of said additive corresponding to 1.5 to 4.0 percent by weight of the sugar component, the resultant product having an average particle fineness of 200 to 325 mesh.

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3,652,299

## PROCESS OF MAKING SAUCE CONCENTRATES

**Edgar W. Penton, Auburn, Wash., assignor to Eduardo's Industries, Auburn, Wash.**

**Continuation-in-part of application Ser. No. 854,776, Sept. 2, 1969, now abandoned , Continuation-in-part of application Ser. No. 533,782, Mar. 14, 1966, now abandoned. This application Dec. 5, 1969, Ser. No. 882,807**
**Int. Cl. A23l** *1/22*
**U.S. Cl. 99—144** **13 Claims**

A sauce concentrate, characterized by being a brittle solid at normal room temperature, composed of from 20–40 percent by weight of an edible fat which is a brittle solid at about 70° F. and has a melting point of 80°–40° F., from 20–40 percent by weight of a starch material, and from 20–40 percent by weight of food sauce flavoring materials made by melting the edible fat, dispersing therein the starch and flavoring materials, and cooling the resulting mixture.

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3,652,300

## PROCESS OF TREATING FRESH FRUITS AND VEGETABLES AND COMPOSITIONS FOR USE THEREIN

**Jagan N. Sharma, West Los Angeles, Calif., assignor to Zenith Processing Corporation, Venice, Calif.**

**Filed Jan. 28, 1970, Ser. No. 6,546**
**Int. Cl. A23b** *7/14*; **A23l** *3/34*
**U.S. Cl. 99—154** **8 Claims**

A method of inhibiting undesirable changes in color, plasmolysis and decay of fresh fruit and vegetables (whole, sliced or shredded) by contacting the same with a liquid treating agent containing benzyl alcohol. The method employs two successive reactions, the first involving naturally occurring oxidases and the second the formation of benzoic acid. Use of solubilizing agents to facilitate the formation of aqueous solutions of benzyl alcohol, and examples of effective ranges of concentration are given.

3,652,301

## POLISH COMPOSITION

**Almeda J. Damron, 1120 Highland Avenue, Ashland, Ky.**

**Filed Oct. 14, 1969, Ser. No. 866,359**
**Int. Cl. C09g** *1/02*
**U.S. Cl. 106—5** **4 Claims**

A new composition for the cleaning and polishing of copper and brass metals comprised of feldspar, sodium chloride, acetic acid, cereal starch and water in specific proportions.

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3,652,302

## ANTIMONY BORATE GLASS COMPOSITIONS

**Victor A. Levand, Jr., 1273 Croyden Road, Lyndhurst, Ohio; Gene I. Thomasson, 13034 Woodcrest Lane, Chesterland, Ohio, and Richard H. Holcomb, 3843 Freemont Road, South Euclid, Ohio**

**Original application Jan. 15, 1970, Ser. No. 3,012, now Patent No. 3,588,315. Divided and this application Nov. 23, 1970, Ser. No. 92,016**
**Int. Cl. C03c** *3/00*
**U.S. Cl. 106—47 R** **2 Claims**

A glass for sealing metallic lead-in conductors in fused silica comprising a low melting antimony borate glass which preferably contains a small amount of molybdenum trioxide and which forms, at elevated temperatures, a molten seal surrounding the conductor.

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3,652,303

## HEAT ABSORBING BLUE SODA-LIME-SILICA GLASS

**Bhogaraju V. Janakirama Rao, Aspinwall, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jan. 26, 1970, Ser. No. 5,796**
**Int. Cl. C03c** *3/04*
**U.S. Cl. 106—52** **2 Claims**

Blue, heat absorbing glasses, particularly infrared absorbing glasses, which have high transmission in the visible portion of the spectrum and are suitable in flat form for use in the automobile, architectural and other heat-shielding applications are disclosed. These glasses consist essentially of lime, soda, silica, 0.05 to 2.0 percent of iron, said iron being in an ionic state, at least 80 percent of which is in the ferrous state, and 0.1 to 15.0 percent tin, a major portion of which is in the stannous state, the ratio of stannous to ferrous ion on a mole percent bases being at least 1:1.

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3,652,304

## NITRIDE-OXIDE REFRACTORIES

**Alma U. Daniels, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed Nov. 21, 1969, Ser. No. 878,893**
**Int. Cl. C04b** *35/58*
**U.S. Cl. 106—57** **6 Claims**

Homogeneous non-porous compositions having an average grain size of less than about 10 microns, a density in excess of 95 percent of theoretical and consisting essentially of 1.10 to 50 volume percent of alumina, zirconia or their mixtures; and 2.50 to 90 volume percent of a nitride of titanium, tantalum, zirconium, hafnium or their mixtures; demonstrate unusual resistance to frictional wear and chemical attack.

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3,652,305

## MOLDABLE HYDRATED MAGNESIUM OXIDE AND THE FORMATION OF MOLDED ARTICLES THEREFROM

**Thomas E. Cook, 3570 Maize Road, Columbus, Ohio**

**Filed Feb. 24, 1970, Ser. No. 13,759**
**Int. Cl. C04b** *35/04*
**U.S. Cl. 106—58** **5 Claims**

A moldable hydrated magnesium oxide and a method of preparing various articles from such material with vitreous

surfaces. The material consists mainly of magnesium oxide, ammonium persulfate which acts as a mineralizing agent, and fillers such as aluminum oxide and fine aggregate. When properly combined and formed into a slurry, the mixture can be poured or injected into a mold or extruded and cured at an elevated temperature to form desired articles which will have vitreous or glassy surfaces. A polar organic compound of the glycol or glycol ether class, which functions both as a wetting agent and a protective colloid, is also preferably used in forming the slurry.

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3,652,306

## HIGH DENSITY REFRACTORY SHAPES AND METHOD FOR PRODUCTION OF SAME

**Jean-Pierre Kiehl, and Georges Valentin, both of Lyon, France, assignors to Societe Generale des Produits Refractaires, Paris, France**

**Continuation-in-part of application Ser. No. 662,276, Aug. 22, 1967, now Patent No. 3,536,505. This application May 8, 1970, Ser. No. 35,890**

**Claims priority, application France, Aug. 26, 1966, 74294; Jan. 16, 1967, 91257**

**Int. Cl. C04b** *35/04*

**U.S. Cl. 106—58** **5 Claims**

High density burned basic refractory shapes having low porosity and creep deformation prepared from a brickmaking batch comprising dead burned magnesia, $Cr_2O_3$, $TiO_2$, chrome ore, calcinated dolomite and 3 percent to 6 percent recrystallization additions comprising calcium silicates smaller than 74$\mu$. The batch is shaped and then fired at between 1,550° C. and 1,680° C. to form a transient viscous phase of high vapor pressure to form monocrystals and crystalline aggregates.

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3,652,307

## ALUMINA REFRACTORIES

**Wate T. Bakker, Severna Park, Md., assignor to General Refractories Company, Philadelphia, Pa.**

**Filed July 7, 1969, Ser. No. 839,663**

**Int. Cl. C04b** *35/10*

**U.S. Cl. 106—65** **8 Claims**

Disclosed herein is a refractory brick batch mix which consists essentially of, by weight, about 85 to 95 percent alumina, about 2.99 to 12.99 percent silica, about 0.01 to 0.5 percent of a lithium compound capable of oxidizing to lithium oxide, and about 2 to 7 percent volatilized silica. Refractories prepared from these mixtures exhibit increased strength, higher density, lower porosity and higher refractoriness compared to those previously available.

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3,652,308

## PROCESS FOR THE MANUFACTURE OF CEMENT CLINKER OF LOW FLUORINE CONTENT

**Heinrich Stich, Linz/Danube; Kurt Ruckensteiner, Leonding near Linz/Danube; Walter Binder, and Josef Hutter, both of Linz/Danube, all of Austria, assignors to Osterreichische Stickstoffwerke Aktiengesellschaft, Linz/Danube, Austria**

**Filed Mar. 2, 1970, Ser. No. 15,843**

**Claims priority, application Austria, Mar. 6, 1969, A2190/69**

**Int. Cl. C04b** *7/04*

**U.S. Cl. 106—103** **2 Claims**

Manufacture of cement clinker low in fluorine compounds from phosphoric acid byproduct gypsum by heating the gypsum itself to temperatures between 500° to 900° C. without the known additives and subsequently mixing the additives with the hot gypsum without cooling the same prior to entering the calcination furnace.

3,652,309

## RETARDED GYPSUM PLASTER FOR USE IN LONG SET AGGREGATED MORTAR APPLICATIONS

**Marvin K. Lane, Chicago, Ill., assignor to United States Gypsum Company, Chicago, Ill.**

**Filed Apr. 1, 1969, Ser. No. 812,371**

**Int. Cl. C04b** *11/00*

**U.S. Cl. 106—110** **1 Claim**

The process of making a gypsum plaster possessing a high degree of stability over extended periods of time and having a set time of at least 4 hours in aggregated mortar applications by providing a specially sized calcined gypsum having a particle size that is essentially all finer than 32 microns, and mixing said specially sized gypsum with retarder, accelerator and other additives to give the desired properties when mixed with water and aggregate.

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3,652,310

## METHOD OF PRODUCING LIGHTWEIGHT, HEAT-INSULATING CONSTRUCTION ELEMENTS FROM LIME AND SILICATE AND PRODUCTS THEREOF

**Stefan Kraemer, Essen; Alois Seidl, Thurnstein, and Michael Seger, Krefeld, all of Germany, assignors to Wasag-Chemie Aktiengesellschaft, Essen, Germany**

**Filed Feb. 3, 1970, Ser. No. 8,435**

**Claims priority, application Germany, Feb. 18, 1969, P 19 08 049.0**

**Int. Cl. C04b** *15/12*

**U.S. Cl. 106—120** **7 Claims**

A method is disclosed by which light and heat-insulating elements, mainly for construction purposes, are manufactured from a mixture of lime and silicates. The method comprises the steps of mixing particles of foamed silicate or glass in a dry or wet state with lime, forming the elements eventually by applying pressure, and hardening the elements in a water vapor-containing atmosphere. The lime is used both in the form of calcium oxide and calcium hydroxide.

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3,652,311

## PROCESS OF MANUFACTURING STRUCTURAL ELEMENTS

**Pieter Simon Wielinga, Vuren Aan Der Waal, Netherlands, assignor to Fabriek van Bouwmaterialen "Loevestein" N.V., Vuren Aan Der Waal, Netherlands and Rheinisch-Westfalische Kalkwerke Aktiengesellschaft, Dorngh, Germany**

**Filed Dec. 22, 1969, Ser. No. 887,421**

**Claims priority, application Netherlands, Dec. 24, 1968, 6818589**

**Int. Cl. C04b** *1/00*

**U.S. Cl. 106—120** **7 Claims**

The invention relates to a process of manufacturing hydrothermally cured structural elements from a mixture of slacked lime, unslacked lime, sand and water, to which is added one or more aliphatic polyhydroxy compounds having at least seven carbon atoms, preferably sodium 1,2,3,4,5,6-hexahydroxyhexane-1-carboxylate, or a derivative thereof, preferably a boron derivative, in a preferred small but effective amount of 0.01 to 0.1 percent by weight of total solids. The mixture is cast into moulds and the resulting structural elements removed therefrom after a short period of time, following which the elements are cured by treatment with steam in an autoclave.

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3,652,312

## PHTHALIMIDE PLASTICIZER AND NON-PROTEINACEOUS RESIN MIX

**James Kern Sears, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.**

**Continuation-in-part of application Ser. No. 704,562, Feb. 12, 1968. This application Jan. 18, 1971, Ser. No. 107,469**

**Int. Cl. C08b** *27/52*

**U.S. Cl. 106—176** **23 Claims**

This invention relates to the use of certain phthalimides as plasticizers for non-proteinaceous thermoplastic resins.

3,652,313

## PIGMENT DISPERSION FOR WATER THINNABLE PAINTS

Nobuyoshi Nagata, Hirakata-shi, and Tsuguo Yamazaki, Nishinomiya-shi, both of Japan, assignors to Nippon Paint Co., Ltd., Oyoda-ku, Osaka, Japan

Continuation of application Ser. No. 435,034, Feb. 24, 1965, now abandoned. This application Mar. 18, 1968, Ser. No. 714,113

Claims priority, application Japan, Feb. 25, 1964, 39/9339; Sept. 8, 1964, 39/50652

Int. Cl. C08b *27/08*; C08f *45/08*

U.S. Cl. 106—193 J 7 Claims

A pigment dispersion for blending with water-thinnable paints, comprising at least one pigment and at least 5 percent by weight of at least one member selected from the group consisting of water-soluble hydroxyalkyl celluloses, water-soluble, partially saponified polyvinyl acetates, water-soluble, partially etherified derivatives of said partially saponified polyvinyl acetates and of polyvinyl alcohol.

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3,652,314

## METHOD FOR RENEWING, RESURFACING, AND PRESERVING PHONOGRAPH RECORDS

Charles S. Castner, Reading, Pa., assignor to Schuyler Development Corporation

Filed Jan. 2, 1969, Ser. No. 788,653

Int. Cl. G11b *3/58*

U.S. Cl. 117—2 2 Claims

A method and composition for initial surface improvement for renewing and/or resurfacing phonograph records by the steps of coating the record with a composition consisting essentially of about two to five parts nonionic acrylic polymer, about two to five parts cationic polyethylene emulsion (25 percent solids in water), about one part nonionic detergent, about two parts diethyl monoethyl ether and about 90 parts water, brushing the composition into the grooves, removing any excess, drying and playing.

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3,652,315

## A DEVELOPING METHOD IN ELECTROPHOTOGRAPHY USING TONER PARTICLES COATED WITH A NON-VOLATILE LIQUID

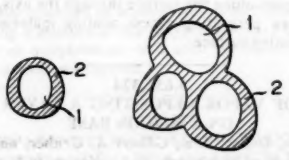
Takehiko Matsuo, Komae Apartment, 17-405, 150, Izumi Komae-cho; Umi Tosaka, 4-10-8, Kita, Asagaya; Tetsuo Hasegawa, 3-23-12, Bunka; Katsunobu Oohara, 2-1388, Sanno-cho, Kaminaruko, and Takashi Ihara, 564, Kami Hirama, Kawasaki-shi, all of Tokyo, Japan

Filed Nov. 7, 1968, Ser. No. 774,065

Claims priority, application Japan, Nov. 13, 1967, 42/72968

Int. Cl. G03g *9/02*, *13/08*

U.S. Cl. 117—17.5 4 Claims




A developing powder for electrophotography comprising toner particles coated with a non-volatile substance such as silicone oil, Teflon oil or liquid paraffin which is liquid at normal temperature. The volume resistivity of said liquid substance is above $1\times 10^{12}\Omega$ cm. and the viscosity is below 1,000 cs. Less than 10 percent by weight of said liquid substance is applied to the toner particles.

3,652,316

## HEAT-SEALABLE HYDROXYETHYL CELLULOSE FILM AND PROCESS FOR PREPARING SAME

Reid L. Mitchell; Charles F. Murphy, both of Morristown, and Edmund M. La Polla, Parsippany, all of N.J., assignors to ITT Rayonier Incorporated, New York, N.Y.

Filed Jan. 23, 1969, Ser. No. 793,551

Int. Cl. B32b *23/08*; C09j *7/02*

U.S. Cl. 117—73 11 Claims

When hydroxyethyl cellulose (HEC) films are treated with a solution of a hydrophobic film former such as polyvinylidene chloride copolymers or nitrocellulose in a volatile solvent to produce a heat sealable coating on the surface of the film, the adhesion between the HEC and the hydrophobic film former is improved by passing the HEC gel film through a conditioning bath containing from about 0.3 to 2.0 percent by weight (based on total bath weight) of a water soluble block copolymer of polyoxyethylene and polyoxypropylene prior to drying the film and applying hydrophobic film former solution thereto.

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3,652,317

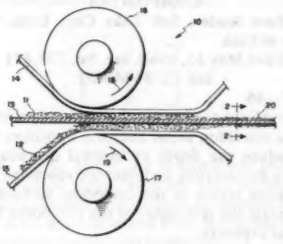
## METHOD OF PRODUCING SUBSTRATE HAVING A PARTICULATE METALLIC COATING

Paolo Della Porta; Tiziano A. Giorgi; Bruno Kindl, and Mario Zucchinelli, all of Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Continuation-in-part of application Ser. No. 527,906, Feb. 16, 1966, now abandoned. This application May 1, 1970, Ser. No. 33,794

Int. Cl. B05b *7/14*; B44c *1/06*, *1/08*

U.S. Cl. 117—22 16 Claims




A method of producing a substrate having a particulate coating of high surface area to mass ratio, said method comprising in sequence the steps of:

I. disposing particles between a substrate and an intermediate body wherein the particles are harder than the substrate; and the intermediate body is softer than the particles but is harder than the substrate;

II. compressing the substrate and intermediate body, with particles therebetween whereby the intermediate body pushes the particles into the substrate; and

III. removing the intermediate body from the particles leaving them embedded in the substrate.

The coating substrates produced by the process of the present invention find utility as catalytic devices to accelerate or retard chemical reactions, as getter devices to sorb residual gases in closed vessels such as electronic tubes, and with further processing as capacitors.

3,652,318
**PROCESS FOR THE PRODUCTION OF ANTIDAZZLE GLASS FILTERS**

**Herbert Heins, Hamburg-Rissen, Germany, assignor to J. D. Moller Optische Werke GmbH, Wedel, Holstein, Germany**

**Continuation-in-part of application Ser. No. 615,932, Feb. 14, 1967, now abandoned. This application Nov. 13, 1969, Ser. No. 876,559**

**Int. Cl. B44d** *5/06;* **C03c** *17/00;* **C23c** *11/00*

**U.S. Cl. 117—33.3** **19 Claims**

Vacuum-coated antidazzle glass filters, such as sunglasses filters, are produced by adding elementary boron or a boron-releasing compound to silicon dioxide and evaporating the mixture onto glass under a vacuum. The minimum thickness of the coating formed by evaporation should be about 1.5 $\mu$. By adding a dyestuff to the mixture before evaporation, the degree of light absorption can be controlled.

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3,652,319
**CYCLIC IMAGING SYSTEM**

**Alan B. Amidon, and Joseph Mammino, Penfield, N.Y., assignors to Xerox Corporation, Rochester, N.Y.**

**Filed Dec. 30, 1969, Ser. No. 889,273**

**Int. Cl. B05c** *3/20;* **B44d** *1/02, 1/52*

**U.S. Cl. 117—37 LE** **24 Claims**

A liquid development imaging system with a cycling imaging surface to which is cyclically applied a film forming insulating solid that wets the imaging surface and sharply liquefies with low melt viscosity at a temperature above ambient operation temperature. The added solid permits relative ease in cleaning and the ability to cycle the imaging surface without complete cleaning.

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3,652,320
**REDUCTION OF CHAR DEPTH IN ABLATIVE COMPOSITES**

**Junior De Vere Seader, Salt Lake City, Utah, assignor to University of Utah**

**Filed May 31, 1968, Ser. No. 733,411**

**Int. Cl. B44d** *1/02*

**U.S. Cl. 117—46** **4 Claims**

Treatment of ablative composite materials with a catalyst comprising a transition metal and/or a transition metal compound to reduce the depth of thermal degradation of the composite by accelerating endothermic reactions in the thermal degradation region of the composite surface to at least partially insulate the remainder of the composite from severe hyperthermal exposure.

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3,652,321
**DEPOSITION OF ALUMINUM ON A GALVANIZED SURFACE**

**Larry H. Hood, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.**

**Filed Aug. 17, 1970, Ser. No. 64,626**

**Int. Cl. B32b** *15/18;* **C23c** *3/00;* **B32b** *15/20*

**U.S. Cl. 117—50** **7 Claims**

A galvanized substrate is plated with aluminum metal by initially heating the substrate to within a temperature range below the melting point of zinc, contacting the heated substrate with a plating solution containing an aluminum alkyl compound: thereby, depositing a thin coating of aluminum on the substrate, raising the temperature of the coated substrate to within a range above the melting point of zinc and contacting the coated substrate with the plating solution, achieving an aluminum plating of a desired thickness on the galvanized substrate.

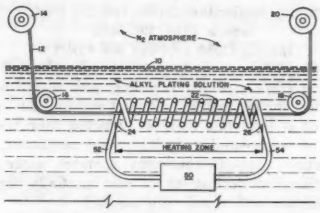
3,652,322
**METHOD FOR CONTROLLING THE HEATING OF A METAL IMMERSED IN A PLATING SOLUTION**

**William B. Stovall, Seabrook, Tex., assignor to Continental Oil Company, Ponca City, Okla.**

**Filed Sept. 3, 1970, Ser. No. 69,222**

**Int. Cl. C23c** *3/00*

**U.S. Cl. 117—93** **5 Claims**




In the plating of a continuously moving metal substrate immersed in a plating solution provided with a means for continuously heating the substrate, the heat input to the substrate is cycled by means therefor to give a series of heat inputs and quenching steps so as to manipulate the temperature of the substrate within a temperature range suitable for plating to thereby achieve a quality coating of a desired thickness.

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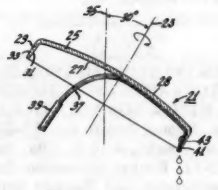
3,652,323
**PROCESS FOR COATING FLATLIKE SURFACES**

**Bradford Knox Smith, Lititz, Pa., assignor to RCA Corporation**

**Filed Dec. 22, 1969, Ser. No. 887,267**

**Int. Cl. B44d** *1/08*

**U.S. Cl. 117—97** **10 Claims**




A process for coating a flatlike surface, such as the inner surface of the viewing panel of a cathode ray tube, comprising

a. slowly rotating the surface, facing downward, about an axis that is substantially normal to the surface,

b. projecting a stream of liquid coating material in a trajectory to contact the rotating surface substantially tangentially and then to pass along the surface through the axis,

c. and then permitting excess coating material to drain from the rotating surface.

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3,652,324
**METHOD OF VAPOR DEPOSITING A LAYER OF $Si_3N_4$ ON A SILICON BASE**

**Ting L. Chu, Dallas, Tex.; Gilbert A. Gruber, and John R. Szedon, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

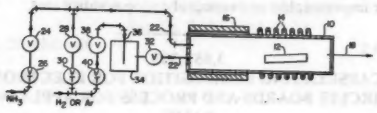
**Continuation-in-part of application Ser. No. 616,695, Feb. 16, 1967, now abandoned. This application Aug. 15, 1968, Ser. No. 752,849**

**Int. Cl. C23c** *11/08, 11/16*

**U.S. Cl. 117—106** **8 Claims**

The present invention relates to dielectric coatings for electronic devices such as rectifiers, transistors and capaci-

tors. More specifically, the invention relates to dielectric coatings comprising silicon nitride films alone or in combination with silicon dioxide films, and to methods for the production of silicon nitride coatings by reacting silane, silicon halides or halosilanes with ammonia.



## 3,652,325
## VAPOR DEPOSITION PROCESS

**Charles D'A Hunt, Orinda, Calif., assignor to Air Reduction Company, Incorporated**

**Filed Dec. 13, 1968, Ser. No. 790,500**
**Int. Cl. C23c** *13/02*
**U.S. Cl. 117—107** **3 Claims**

A vacuum vapor deposition process is described for depositing a coating of an iron-base alloy on a substrate. The quality of the deposited coating is improved by maintaining the substrate above a minimum temperature of 1,600° F., in the case of alloys with substantially soluble constituents, and of 1,700° F., in the case of alloys having at least partially insoluble constituents.

## 3,652,326
## SIZING COMPOSITION AND GLASS FIBERS TREATED THEREWITH

**John E. Ward, Houghton, Mich., assignor to Owens-Corning Fiberglas Corporation**

**Filed Apr. 3, 1970, Ser. No. 25,584**
**Int. Cl. C03c** *25/02*
**U.S. Cl. 117—126 GE** **4 Claims**

A sizing for glass fibers, comprising water soluble epoxy resins, an organosilane, polyvinyl acetate copolymer and a lubricant is provided, whereby the sized glass fibers in the form of strands possess excellent integrity.

## 3,652,327
## COATINGS OF ARYLENE SULFIDE POLYMERS

**Harold Wayne Hill, Jr., and James T. Edmonds, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company**

**Filed July 25, 1969, Ser. No. 845,098**
**Int. Cl. B32b** *15/08, 17/10;* **C04b** *41/06*
**U.S. Cl. 117—132 B** **7 Claims**

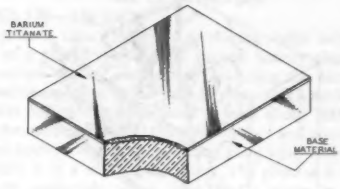
Adherent coatings of arylene sulfide polymers are formed by applying a mixture of the polymer and an oxide or sulfide of cobalt or molybdenum to a solid substrate such as iron, steel, aluminum and ceramic.

## 3,652,328
## TRANSPARENT PLASTIC HAVING TRANSPARENT MAR-RESISTANT COATING OF BARIUM TITANATE

**Ronald A. Dork, Utica, and Ronald E. White, Romeo, both of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Sept. 2, 1969, Ser. No. 854,528**
**Int. Cl. B32b** *27/06;* **B44d** *5/00*
**U.S. Cl. 117—138.8UA** **3 Claims**

A composite optical element is disclosed having a synthetic resin substrate and an abrasion resistant surface coating of barium titanate. A polycarbonate resin substrate and an R.F. vacuum sputtered barium titanate protective surface coating



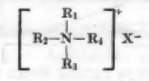

provides a particularly tough and abrasion resistant optical element such as a window or windshield.

## 3,652,329
## METHOD OF TREATING TEXTILES

**Peter H. Vossos, Lisle, Ill., assignor to Nalco Chemical Company, Chicago, Ill.**

**Filed Jan. 27, 1970, Ser. No. 6,328**
**Int. Cl. C10m** *5/20*
**U.S. Cl. 117—139.5CQ** **10 Claims**

Covers textile treating compositions and a method of improving the strength and other desirable properties of textiles by contacting said textile with an organosol comprising a non-polar organic solvent having uniformly dispersed therein discrete, dense colloidal particles of amorphous silica having an average particle diameter of 3–150 millimicrons and an average surface area of from about 20 $M^2/g.$ to 1,000 $M.^2/g.$, said silica particles having absorbed upon their surfaces a quaternary ammonium salt or hydroxide, with the weight ratio silica, expressed as $SiO_2$ to the quaternary ammonium salt or hydroxide being at least 2:1, wherein the quaternary ammonium compound has the formula:



wherein $R_1$, $R_2$, $R_3$ and $R_4$ are hydrocarbon groups containing one–22 carbon atoms, with the total number of carbon atoms in said quaternary ammonium compound being at least 10, and X is an anion selected from the group consisting of chloride, bromide, iodide and hydroxide.

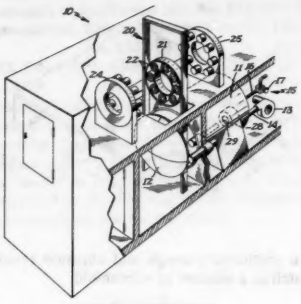
## 3,652,330
## PROCESS FOR COATING AMORPHOUS SELENIUM

**Donald E. Anderson, Northfield, Minn., assignor to G. T. Schjeldahl Company, Northfield, Minn.**

**Filed Sept. 14, 1970, Ser. No. 71,671**
**Int. Cl. G03g** *7/00*
**U.S. Cl. 117—201** **5 Claims**

The method of applying a film of amorphous selenium to a substrate having a generally cylindrical surface, the method comprising inserting a charge of selenium into a generally cylindrical crucible having an inner wall extending in spaced relationship to a cylindrical axis, and treating the selenium charged therein so as to dispose the charge generally along the walls of the crucible so as to define a generally cylindrical charge profile uniformly spaced about the crucible axis. This treatment is preferably accomplished by the rotation of the crucible about its axis at a rate sufficient to centrifugally force the charge to a uniformly cylindrically profiled form. The charge is thereafter heated to a temperature at least suf-

ficient to cause sublimation of the selenium within the crucible, while the charge is rotated about is axis at a rate sufficient to hold the charge uniformly about the inner crucible wall. While this is occurring, the substrate is inserted into the



crucible with the outer cylindrical surface being spaced a predetermined distance from the surface of the cylindrical charge profile. During the deposition of the selenium onto the substrate surface, the substrate is chilled to a temperature ranging from between about 50° C. and 70° C.

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**3,652,331**

**PROCESS FOR FORMING A FILM ON THE SURFACE OF A SUBSTRATE BY A GAS PHASE**

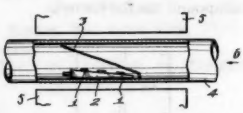
**Shumpei Yamazaki, 20, 7, 1-chome, Shinkawa, Shizuoka, Japan**

**Filed Mar. 13, 1969, Ser. No. 806,851**

**Claims priority, application Japan, Mar. 22, 1968, 43/18611; Oct. 3, 1968, 43/71972**

**Int. Cl. C23c** *13/04*

**U.S. Cl. 117—201** **10 Claims**



A process for forming a film on the surface of a substrate by a gas phase method in the presence of a catalyst used in the solid state electronics at a predetermined distance from the surface of the substrate on which the film is to be formed and a process for forming a silicon oxide or silicon nitride in the presence of a catalyst selected from the group comprising platinum and the like.

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**3,652,332**

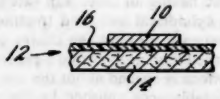
**MANUFACTURE OF PRINTED CIRCUITS**

**John Seemann Brand, Cranbury, and Vladimir Paul Honelser, Lawrenceville, both of N.J., assignors to American Can Company, New York, N.Y.**

**Filed July 6, 1970, Ser. No. 52,520**

**Int. Cl. B44d** *1/18;* **H01h** *37/36;* **H05h** *3/12*

**U.S. Cl. 117—212** **7 Claims**



Circuits including conductors and impedance elements are printed on paper. Component values are maintained within acceptable limits of variation by correlated selection of substrate porosity and ink to produce a high degree of absorption of the liquid ink vehicle into the porous substrate while producing relatively little penetration of the pigment. Resistance values are lowered, and their reliability and consistency greatly improved, as compared with printing on either impermeable or excessively porous substrates.

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**3,652,333**

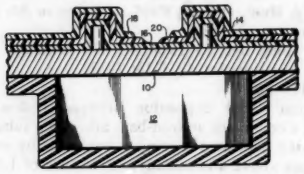
**ENCAPSULATING COMPOSITION FOR ELECTRONIC CIRCUIT BOARDS AND PROCESS FOR APPLYING SAME**

**John M. Warren, Weatherford, Tex., assignor to General Dynamics Corporation, Ft. Worth, Tex.**

**Filed Feb. 2, 1970, Ser. No. 7,912**

**Int. Cl. B44d** *1/42;* **H01b** *3/30*

**U.S. Cl. 117—218** **5 Claims**



A process for applying a polyurethane gel composition for coating and encapsulating the electronic circuitry on a circuit board wherein the said composition consists essentially of an admixture of an elastomeric linear polyesterurethane of high molecular weight; a tetrahydrofuran intermediate monomer solvent and ethylene glycol monoethylether acetate, which composition is preferably sprayed over the object circuitry and onto the related electronic circuit board or other substrate as a vaporized gel of minute viscous globules which simultaneously forms a substantially uniform protective film over the substrate and encapsulates the circuit's conduit and conduit terminals as well as other protrusions, including elements having sharp points, knife edges and the like. This prime coat is then dried and may be subsequently followed by one or more dip coatings which are formed by immersion of the dried workpiece into a mixture of polymethyl methacrylate with a copolymer of ethyl acrylate/methyl methylacrylate.

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**3,652,334**

**MAGNETIC MATERIAL AND METHOD OF MAKING THE SAME**

**Wilhelm Abeck, Leverkusen-Steinbuechel; Heinrich Kober, Munich, and Bernhard Seidel, Gruenwald, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany**

**Filed Nov. 7, 1968, Ser. No. 774,209**

**Claims priority, application Germany, Nov. 25, 1967, P 15 92 214.2**

**Int. Cl. H01f** *10/00*

**U.S. Cl. 117—236** **10 Claims**

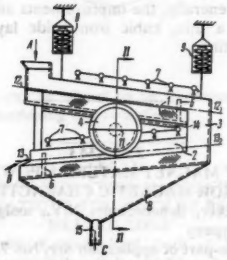
Magnetic gamma-$Fe_2O_3$ particles particularly useful as magnetizable material for magnetic recording media, area produced by treating alpha-FeOOH particles with a solution of a hydrolysis-resistant, inorganic substance capable of forming on the alpha-FeOOH particles a firmly adhering covering, so that the individual alpha-FeOOH particles will be substantially covered by such substance, and by converting the thus pretreated alpha-FeOOH particles into gamma-$Fe_2O_3$.

3,652,335

## APPARATUS FOR WASHING LUMPY NON-METALLIC MATERIALS

Roman Andrianovich Rodin, ul. Kostyanova,9, kv. 74, and Vasily Vasilievich Oljunin, Zelenograd, 316, kv. 37, both of Moscow, U.S.S.R.

Filed May 1, 1969, Ser. No. 820,841
Int. Cl. B08b *3/02*
U.S. Cl. 134—66 2 Claims



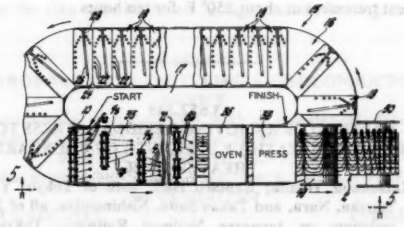
A device for washing lumpy generally nonmetallic materials, particularly broken stone, gravel and flux materials, capable of high-quality washing of the materials, including high-filling level or capacity for the spouts, the possibility to control the washing time in dependence with the degree of contamination of the material being washed, the perforated spouts being arranged in tandem one above the other in such a manner that each pair of adjacent spouts is inclined oppositely with respect to each other so as to convey the material being washed from one spout to the other successively, and including vibrating means to facilitate material conveyance.

3,652,336

## WOUND-WIRE STORAGE BATTERY GRID AND PROCESS

Ellis G. Wheadon, and Charles P. McCartney, both of Yorktown, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 8, 1970, Ser. No. 70,008
Int. Cl. H01m *35/04*
U.S. Cl. 136—60 1 Claim




A storage battery grid cut from a continuous strip of wound-wire grid segments. Continuous lengths of a plurality of wires periodically are gathered into lug-forming nested loops and fanlike arrays of conductors. Nonconductive reinforcing filaments crisscross and are bonded to the conductors at a plurality of fusion-interlocked joints.

3,652,337

## CASTING PLATE STRAPS TO BATTERY PLATES

Renard E. Mix, Yorktown, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 25, 1969, Ser. No. 852,605
Int. Cl. H01m *35/32*
U.S. Cl. 136—134 R 3 Claims

A process for consistently producing welds between portions of a plurality of Pb-acid storage battery plates and in-situ cast-on battery plate straps, including the essential step of coating a portion of the battery plate with a molten film of an alloy having a melting point at least about 200° F. lower than the melting point of the battery plate and contacting the coated portion with molten battery plate strap material while said film is in a molten condition. The process is most particularly applicable when using Pb-Ca alloys in the plate groups.

3,652,338

## ELECTROCHEMICAL SYSTEM COMPRISING LAYERED SILICATE FILM SEPARATOR

Allen Charkey, Flushing, and Derryk Brooks-Smith, Brooklyn, both of N.Y., assignors to Yardney International Corporation, New York, N.Y.

Filed Aug. 22, 1969, Ser. No. 852,497
Int. Cl. H01m *3/00*
U.S. Cl. 136—146 5 Claims

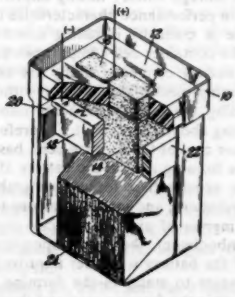
Films, membranes and pellicle coatings of layered silicates are provided for selective ion separation. These films, as coatings upon a substrates or as flexible self-supporting foils, provide ion separation by selectively restricting ion mobility, particularly, but also, to some extent, molecular mobility as well. The specific use of layered silicates provides selective separations that are more complete than those available with similar silicates generally, not possessing the layered structures. These films are advantageously used in the strenuous environment of rechargeable electrochemical cells where they function as excellent interelectrode separators. The use of polymers as binders for the films is disclosed but the disclosure is not limited to the use of binders and the layered silicates may be formed into binderless pellicles upon substrates.

3,652,339

## REGENERATIVE LIME SHEET FOR USE IN PRIMARY GALVANIC BATTERIES EMPLOYING A ZINC ANODE

Carl A. Grulke, Berea, Ohio, assignor to Union Carbide Corporation

Original application Aug. 10, 1967, Ser. No. 659,810, now Patent No. 3,497,391, dated Feb. 24, 1970. Divided and this application Oct. 6, 1969, Ser. No. 870,833
Int. Cl. H01m *33/00*; C04b *1/00*
U.S. Cl. 136—161 16 Claims




For use as the regenerative lime material in an alkaline primary galvanic battery of the type employing a zinc anode, a

thin porous regenerative lime sheet comprising colloidal lime particles and dispersed cellulose fibers bonded together with an organic binder insoluble in the alkaline electrolyte of the battery.

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**3,652,340**

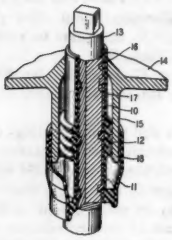
**APPARATUS FOR AND METHOD OF FORMING POST SEAL FOR LEAD-ACID CELL**

**Louis H. Sharpe, Morris Township; Jayant R. Shroff, Morristown, and Frank J. Vaccaro, Parsippany, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Continuation-in-part of application Ser. No. 831,611, June 9, 1969, now abandoned. This application Dec. 29, 1969, Ser. No. 888,388**

**Int. Cl. H01m** *1/02*

**U.S. Cl. 136—168** **6 Claims**




A post seal design for a lead-acid cell utilizes the combination of a one-piece flexible seal and a post coated with a relatively rigid adhesive coating to inhibit acid leakage. Additionally, the post may contain a number of grooves in its periphery to further inhibit leakage resulting from corrosion of the post. The coating may be applied to the post prior to the installation of the flexible seal thereon, or alternatively, the flexible seal may be used as a mold to cast the coating in place on the post after the installation of the flexible seal.

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**3,652,341**

**METHOD OF MAKING A DRY CHARGED BATTERY**

**Vincent Michael Halsall, Bayside, and Edward Norman Mrotek, Greendale, both of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.**

**Filed May 12, 1970, Ser. No. 36,662**

**Int. Cl. H01m** *7/00, 35/30*

**U.S. Cl. 136—176** **15 Claims**

A charged storage battery having improved low temperature activation performance characteristics upon the addition of electrolyte is made by installing assembled battery elements into the container cell compartments; electrically connecting the battery elements; filling the cell compartments with the forming electrolyte, with or without the cover installed; forming the battery elements into a fully charged state; removing about 70 to about 97 (preferably about 77 to 87) weight per cent of the forming acid, based upon the total weight of the forming acid in the battery after formation, by applying an accelerative force (preferably a centrifugal force) to the battery; and installing means to seal the battery against the ingress of air into the cell compartments. In a preferred embodiment, the low temperature activation performance of the battery is further improved by allowing the battery elements to stand in the forming electrolyte for a time period after the forming step and then applying a boost charge to the battery elements prior to removing the forming acid.

**3,652,342**

**RAZOR BLADES AND PROCESSES FOR THE PREPARATION THEREOF**

**Irwin W. Fischbein; Francis E. Flaherty, both of Canton; Edward P. McLaughlin, Braintree, and Fred T. Willett, Norwood, all of Mass., assignors to The Gillette Company, Boston, Mass.**

**Filed June 7, 1967, Ser. No. 644,052**

**Int. Cl. B44d** *1/36*

**U.S. Cl. 148—6.35** **11 Claims**

The present invention is concerned with steel razor blades having a fluorocarbon polymeric coating thereon and more particularly with processes for producing improved blades of that nature. Generally, the improvements are brought about by providing a thin, cubic iron oxide layer beneath the polymeric coating.

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**3,652,343**

**PERMANENT MAGNET MATERIAL POWDERS HAVING SUPERIOR MAGNETIC CHARACTERISTICS**

**Joseph J. Becker, Schenectady, N.Y., assignor to General Electric Company**

**Continuation-in-part of application Ser. No. 730,577, May 20, 1968, now Patent No. 3,558,371. This application Sept. 14, 1970, Ser. No. 72,099**

**Int. Cl. H01f** *1/06*

**U.S. Cl. 148—31.57** **4 Claims**

The coercive force of cobalt-rare earth intermetallic compounds is greatly enchanced by treating the compounds in finely divided form with acid.

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**3,652,344**

**ALUMINUM ALLOY-STEEL BEARING AND METHOD OF MAKING SAME**

**George R. Kingsbury, Cleveland, and Raymond L. Slater, Novelty, both of Ohio, assignors to Clevite Corporation**

**Filed Sept. 25, 1969, Ser. No. 861,196**

**Int. Cl. B21d** *53/10*; **C21d** *1/46, 9/40*

**U.S. Cl. 148—127** **6 Claims**

Bimetallic bearing material comprising aluminum alloys consisting of silicon, cadmium, copper, magnesium, and the balance aluminum, bonded directly on steel backings, are heat treated to effect improved hardness and fatigue resistance. The heat treatment comprises solution heating said bearing material at temperatures ranging from 900° F. to 975° F. for at least 15 seconds but not exceeding 80 seconds, after which it is rapidly quenched in a fluid medium having a maximum temperature of 100° F., followed by precipitation heat treatment at about 350° F. for ten hours.

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**3,652,345**

**METHOD OF REMOVING RESIDUAL STRESS FOR IMPROVING FATIGUE STRENGTH OF BOUNDARY OF HEATED ZONE**

**Katsunobu Tomita; Kentaro Ishii, both of Tokyo; Yoshito Tanaka, Nara, and Takao Saito, Nishinomiya, all of Japan, assignors to Japanese National Railways, Tokyo and Sumitomo Metal Industries Limited, Osaka, Japan**

**Filed Sept. 17, 1969, Ser. No. 858,814**

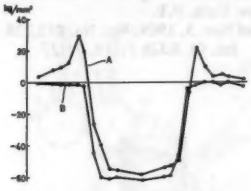
**Claims priority, application Japan, Sept. 18, 1968, 43/67744**

**Int. Cl. C21d** *1/06, 1/08, 1/10*

**U.S. Cl. 148—134** **4 Claims**

A method for removal of residual tensile stresses from a locally casehardened steel object is disclosed. In accordance

with the method, a projecting fillet is provided at the boundary of the zone on the object to be hardened. The fillet is removed after hardening is accomplished.

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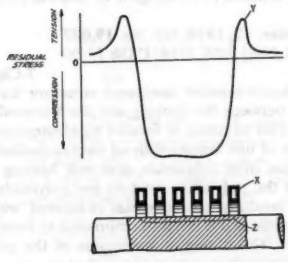
3,652,346

## METHOD OF INDUCTION HARDENING FOR IMPROVING FATIGUE STRENGTH OF BOUNDARY OF HEATED ZONE

**Katsunobu Tomita; Kentaro Ishii, both of Tokyo; Yoshito Tanaka, Nara, and Takao Saito, Nishinomiya, all of Japan, assignors to Japanese National Railways, Tokyo, Japan and Sumitomo Metal Industries, Limited, Osaka, Japan**

**Filed Sept. 17, 1969, Ser. No. 858,812**
**Claims priority, application Japan, Sept. 18, 1968, 43/67742**
**Int. Cl. C21d** *1/10, 1/66*
**U.S. Cl. 148—154** **4 Claims**




Residual tensile stresses are reduced in a locally casehardened steel object by cooling the boundary zone adjacent the area to be hardened during induction heating.

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3,652,347

## METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE

**Minoru Nagata, and Kozi Sato, both of Kodaira-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Nov. 4, 1968, Ser. No. 772,913**
**Claims priority, application Japan, Nov. 6, 1967, 42/70971**
**Int. Cl. H01l** *7/44*
**U.S. Cl. 148—187** **13 Claims**

A method for manufacturing a lateral transistor, formed by selectively diffusing a P type emitter region on one principal surface of an N type silicon substrate and introducing acceptor impurity in said emitter region and in one portion of the surface of said substrate at a prescribed distance from said emitter region, thereby forming an emitter region and a P type collector region which have a high surface impurity concentration.

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3,652,348

## LIQUIDS THICKENED WITH SUBMICROSCOPIC BETA-SILICON CARBIDE FIBER SHEATHED WITH SILICA

**George Baum, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.**

**Filed June 9, 1967, Ser. No. 644,979**
**Int. Cl. C10l** *7/02;* **C06d** *5/00*
**U.S. Cl. 149—36** **10 Claims**

This invention relates to a method for increasing the viscosity of polar and nonpolar liquids through the addition thereto of submicroscopic-sized fibers containing silica-sheathed, beta-silicon carbide crystals, said fibers having diameters averaging about 0.025 microns and aspect ratios greater than about 1,000:1.

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3,652,349

## THIXOTROPIC GAS PRODUCING GEL

**Herbert A. Bartick, Alexandria, Va., assignor to The Susquehanna Corporation, Fairfax County, Va.**

**Filed Aug. 25, 1969, Ser. No. 852,904**
**Int. Cl. C06b** *11/00, 19/04*
**U.S. Cl. 149—42** **7 Claims**

A combustible gas producing gel having a viscosity up to about 200 poise at a 100 reciprocal second rate of shear and a temperature of minus 65° F. and being thermally stable at temperatures up to about 165° F. comprising the combination of solid consumable particles suspended in a hydrocarbon carrier having eight to 10 carbon atoms and containing an arganoaluminum phosphonate gelling agent. The solid consumable particles may be present in a concentration of from about 77 percent to about 95 percent by weight based upon the total weight of gel; the hydrocarbon carrier may be present in a concentration of from about 5 percent to about 23 percent by weight based upon the total weight of the gel; and the weight ratio of the hydrocarbon carrier to the gelling agent is less than about 100. The solid consumable particles may be all oxidizer particles or a combination of oxidizer and fuel particles.

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3,652,350

## METHOD OF BLENDING PYROTECHNIC MIXTURES

**Hubert G. Timmermans, Manhatten Beach, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.**

**Filed June 23, 1969, Ser. No. 835,917**
**Int. Cl. C06b** *11/00*
**U.S. Cl. 149—109** **8 Claims**

A method of blending pyrotechnic mixtures of the class which include an organic binder, fuel powder and oxidizer powder, comprising the dissolving of the binder in a first solvent in which it is substantially soluble and in which the fuel and oxidizer powders are substantially insoluble so as to form a binder solution, mixing the fuel and oxidizer powders into said binder solution, adding a second solvent to the product of the foregoing steps in which second solvent the binder, fuel powder and oxidizer powder are substantially insoluble in an amount sufficient to cause the precipitation of the major proportion of the binder, and then removing the solvents and drying the precipitate. This method produces a uniformly granulated product which needs no mechanical handling to secure the mixture or granulation, these properties being obtained in a wet environment devoid of the risk of explosion.

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3,652,351

## PROCESSES FOR ETCHING SYNTHETIC POLYMER RESINS WITH ALKALINE ALKALI METAL MANGANATE SOLUTIONS

**Medie B. Guisti, Spring Valley, Ill., assignor to Carus Corporation, La Salle, Ill.**

**Filed May 13, 1970, Ser. No. 37,008**
**Int. Cl. B44c** *1/22;* **C23b** *5/62*
**U.S. Cl. 156—2** **3 Claims**

Processes for etching synthetic polymer resins, particularly

ABS resins, with aqueous, alkaline solutions of alkali metal manganate (VI) at low temperatures.

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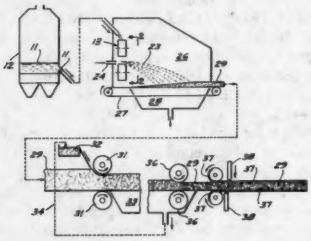
3,652,352

**PROCESS FOR MANUFACTURE OF HARD MINERAL FIBER SLABS WITH COATING**

**Frantisek Milsimer, and Jiri Zampach, both of Prague, Czechoslovakia, assignors to World Patent Development Corp.**

**Filed Nov. 24, 1969, Ser. No. 879,265**
**Claims priority, application Czechoslovakia, Nov. 26, 1968, 8072/68**
**Int. Cl. B29j** *5/00*
**U.S. Cl. 156—62.4** **2 Claims**



This disclosure teaches a method of manufacturing hard mineral fiber slabs with a surface finish produced from paper impregnated by a spirit solution of phenolformaldehydrate resin, adding at the same time a spirit solution of stearine and a water-spirit solution of hexamethylenetetramine together with a wetting agent. The paper is pressed onto a carpet made of mineral fibers impregnated by resin.

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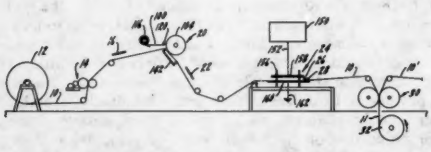
3,652,353

**METHOD OF MAKING A NON-WOVEN REINFORCED LAMINATE**

**Alfred E. Belisle, Westbrook, Maine, and John C. Nelson, Appleton, Wis., assignors to Fox River Paper Corp., Appleton, Wis.**

**Filed June 9, 1969, Ser. No. 831,334**
**Int. Cl. B32b** *17/00*
**U.S. Cl. 156—62.4** **18 Claims**



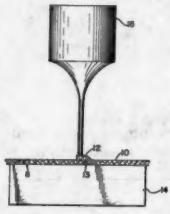
Disclosed is a non-woven reinforced laminate having an upper and lower web with two layers of fibers therebetween, wherein the fibers are substantially parallel within each of the layers and substantially perpendicular to the fibers in the adjacent and a method and apparatus for forming the laminate which include driving a web material along a predetermined route, applying an adhesive to the web in a predetermined pattern, depositing portion of fibers onto the adhesive, causing the remaining free portions of the fibers to stand upwardly from the web, deflecting the upstanding free portions to the surface of the web at an angle relative to the route direction, and laminating the web having the deflected fibers to a second web similarly processed whereby the fibers of the adjoining layers are substantially perpendicularly disposed with respect to each other.

3,652,354

**METHOD OF PREPARING LAMINATES OF FIBROUS CELLULOSIC WEBS USING ULTRASONIC ENERGY**

**Chen-Jen Su, Alsip, Ill., assignor to Continental Can Company, Inc., New York, N.Y.**

**Filed Nov. 3, 1969, Ser. No. 873,238**
**Int. Cl. B32b** *31/16, 31/27*
**U.S. Cl. 156—73** **13 Claims**



Laminates of cellulosic webs are prepared by contacting at least part of a surface of one of the cellulosic webs to be laminated with an aqueous solution of an inorganic metal salt complex to effect swelling of the surface, placing the swelled portion of the contacted web in overlapping contact with the surface a second web to form a laminate assembly and then subjecting the assembly to a source of ultrasonic energy to effect bonding.

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3,652,355

**METALLIC LAMINATED STRUCTURE AND METHOD**

**Catlyle S. Herrick, Alplaus, N.Y., assignor to General Electric Company**

**Filed Mar. 12, 1970, Ser. No. 19,087**
**Int. Cl. C09j** *5/06, 3/14;* **C23b** *13/00*
**U.S. Cl. 156—151** **7 Claims**

A metallic polyimide-bonded laminated structure having enhanced bonding between the laminae and the intermediate polyimide binder. This structure is formed by electrocoating at least one surface of one lamina with an electroconducting solution or emulsion of a polyamide acid and heating the coating to convert the polyamide acid to the polyimide. A composite of the resulting coated metal is formed with a second metallic lamina, and it is heat-compressed to form the laminated structure. The curing or conversion of the polyamide acid to the polyimide is carried out so that any water of imidization liberated during the heat-compression is insufficient to form an adhesively-weakening amount of metallic oxide of the laminate.

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3,652,356

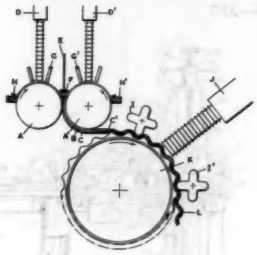
**PROCESS FOR MAKING REINFORCED POLYESTER LAMINATES UTILIZING IRRADIATION**

**Rene L. E. Van Gasse, Schoten, Belgium, and Petrus J. C. A. Simonis, Maassluis, Netherlands, assignors to N.V. Chemische Industrie "Synres", Hoek von Holland, Netherlands**

**Filed Feb. 6, 1968, Ser. No. 703,459**
**Claims priority, application Netherlands, Feb. 7, 1967, 6701813**
**Int. Cl. B32b** *5/00*
**U.S. Cl. 156—179** **11 Claims**

Reinforced polyester laminates are made by building up a laminate from unsaturated polyester resin and reinforcing material, such as glass fiber matting, the laminate being sandwiched between two foils during the polymerization and curing, and the polyester resin being polymerized by irradiation with high-energy electrons. Preferably the laminate is provided with permanent foils, produced by applying foils of un-

saturated polyester resin in partly polymerized state to the laminate on both sides thereof and then irradiating the com-



posite laminate with high-energy electrons to complete polymerization, whereby the foils are firmly bonded to the laminate.

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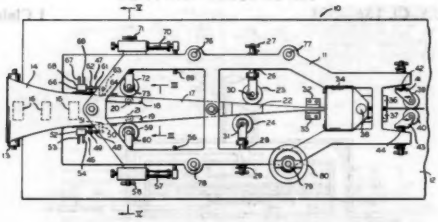
**3,652,357**

## METHOD AND APPARATUS FOR WEB EDGE ALIGNMENT

**Walter H. Vogel; Richard H. Cochrane, and Robert C. James, all of Sheboygan, Wis., assignors to Hayssen Manufacturing Company, Sheboygan, Wis.**

**Filed Oct. 22, 1968, Ser. No. 769,534**
**Int. Cl. B29d *23/10***
**U.S. Cl. 156—203** **18 Claims**



A sensor for controlling the edge position of a moving web wherein a finger rides along the edge being sensed and the position of the finger is used to control an air valve to develop fluid control signals indicative of edge position. One surface of the web moves across a backup plate or roller and the other surface of the web is provided with a tracking roller opposite the backup plate. The tracking roller is pivotable in a plane substantially parallel to the movement of the web. The fluid pressure from the air valve is used to pivot the tracking roller in response to web edge position thereby maintaining the web edge in a desired location. The apparatus includes a transport device for applying articles to the surface of the web and for folding the web to confine the articles therein. Sensors and tracking rollers are disposed on opposite sides of the machine and constantly sense and constantly adjust the edges of the moving web. The sensors are provided with an eccentric mounting to adjust the web height at which each sensor begins to operate its associated air valve.

**3,652,358**

## PROCESS FOR THE BONDING OF MULTILAYER, OVERLAPPING FOIL RIBBONS

**Ulrich Strole, Leutershausen; Rudolf Klein, Mutterstadt, and Walter Weidinger, Mannheim-Kafertal, all of Germany, assignors to Zellstoffabrik Waldhof AG, Mannheim-Waldhof, Germany**

**Filed Dec. 27, 1967, Ser. No. 693,745**
**Claims priority, application Germany, Dec. 31, 1966, Z 12,623**
**Int. Cl. B29d *23/10***
**U.S. Cl. 156—218** **4 Claims**

This invention relates to a process for the bonding of multilayer, overlapping foil ribbons of thermoplastic material comprising the steps of forming a continuous length of at least two foil ribbons of cold thermoplastic material to overlap at the edges, whereby the said overlap comprises at least four layers of said foil ribbon, inserting a continuous heated strip of thermoplastic material in thermoplastic condition between two of said overlapping layers, said continuous heated strip having a width of less than said overlap and a temperature above that required to cause said foil ribbons of thermoplastic material to become viscous and below that required to cause said foil ribbons of thermoplastic material to melt, compacting said overlap, whereby a union is formed between said at least four layers of said foil ribbon in said overlap and said continuous strip, cooling said union and recovering a continuous, bonded, multilayer overlapping foil ribbon.

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**3,652,359**

## PROCESS OF FORMING UPHOLSTERY

**Donald L. Decker, Newburgh, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.**

**Filed Sept. 11, 1967, Ser. No. 666,941**
**Int. Cl. B29c *17/00***
**U.S. Cl. 156—224** **5 Claims**

A process for molding an article of manufacture consisting of forming a laminate composed of a stretch fabric bonded to stretchable plastic film with an adhesive system. The laminate is heated to between 270°–295° F. and molded under pressure of 2 to 8 p.s.i.a. and products formed by said process.

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**3,652,360**

## METHOD FOR MANUFACTURING MASS PARTICLES IN A VISCOELASTIC MATRIX

**Seymour Hartman, Mahopac, N.Y., and Francis F. Sullivan, Santa Barbara, Calif., assignors to U.S. Plywood-Champion Papers Inc., New York, N.Y.**

**Original application May 12, 1965, Ser. No. 455,247, now Patent No. 3,424,270, dated Jan. 28, 1969, Continuation-in-part of application Ser. No. 317,204, Oct. 18, 1963, now abandoned. Divided and this application Jan. 23, 1969, Ser. No. 793,317**
**Int. Cl. B29f *3/02*; B32b *15/08*, *15/16***
**U.S. Cl. 156—244** **4 Claims**

The present invention is broadly concerned with the method of manufacture of a novel composition of matter which possesses the physical properties of mass and viscoelasticity for the preparation of high quality acoustical structural units as, for example, a panel, a wall, a ceiling, a floor, or any partition wherein it is desired that it possess high acoustical or a high sound transmission loss in high quality stereo speaker enclosures and in X-ray and radiation shielding.

3,652,361

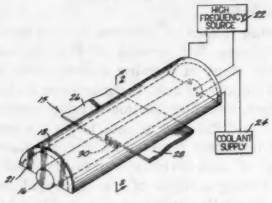
## PROCESS FOR INDUCTION HEATING

Alfred F. Leatherman, 4256 Mountview Road, Columbus, Ohio, assignor to William C. Heller, Jr.

Original application Oct. 18, 1965, Ser. No. 497,381, now Patent No. 3,510,619, dated May 5, 1970. Divided and this application Dec. 1, 1969, Ser. No. 881,171

Int. Cl. B23k 13/00

U.S. Cl. 156—272 3 Claims




An induction heating process provides a localized high frequency magnetic field by interacting a central high frequency magnetic field with a surrounding high frequency magnetic field. The localized magnetic field may be used to inductively heat nonmetallic material by means of a susceptor.

3,652,362

## HOT MELT ADHESIVE BONDING PROCESS FOR CORRUGATED PAPERBOARD

Saburo Odagiri, Yokohama-shi, Japan, assignor to Toyo Mokuzai Kigyo Kabushiki Kaisha, Otaru-shi, Hokkaido, Japan

Filed June 2, 1969, Ser. No. 829,742

Claims priority, application Japan, June 4, 1968, 43/38208

Int. Cl. C09j 5/06

U.S. Cl. 156—321 2 Claims

A bonding process in which a first material is coated with a hot melt adhesive which is heated to 1.5–1.7 times its melting temperature. The coated first material is then cooled to 0.6–0.7 times said melting point and then a second material which is heated to a temperature of 1–1.2 times the melting point of the adhesive is pressed against the coated first material.

3,652,363

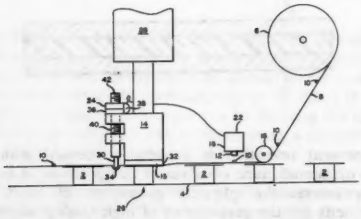
## FILM POSITIONING APPARATUS

William G. Kinslow, Jr., Kansas City, Mo., assignor to Phillips Petroleum Company

Filed Oct. 23, 1969, Ser. No. 868,676

Int. Cl. B29c 27/06; B65h 25/06

U.S. Cl. 156—361 5 Claims



An apparatus for intermittently, longitudinally adjusting a printed portion of a continuous film relative to a container prior to sealing said film to the container to form a cover thereof.

3,652,364

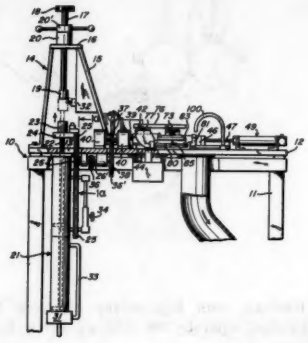
## CARTRIDGE WINDING MACHINE

Frank F. Ali, 2973 Pascal Drive, Fairborn, Ohio

Filed Sept. 30, 1969, Ser. No. 862,261

Int. Cl. B05b 3/02

U.S. Cl. 156—357 15 Claims



An automatic cartridge winding machine, a preferred embodiment of which provides means responding to receipt of a strip of abrasive surfaced material to wind the same to a generally cylindrical or conical form, to seal the strip to such form and to responsively eject the same as a finished product.

3,652,365

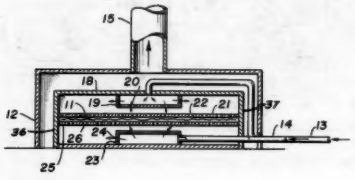
## GAS INJECTION APPARATUS

William C. Mallonee, 3741 Curtis Street, Chester, Va.

Filed Jan. 2, 1970, Ser. No. 64

Int. Cl. B32b 31/26, 17/04

U.S. Cl. 156—381 1 Claim



An activating gas chamber intimately mixes an activating gas with a nonwoven fabric as a pre-condition for interfilament bonding by increasing the velocity of the gas sufficiently such that complete penetration of the fabric by the gas is obtained in an enclosed environment.

3,652,366

## APPARATUS FOR FORMING CYLINDRICAL TANKS

Dominique Carlini, Rousset, France, assignor to Recherches Et Applications Des Plastiques Dans L'Industrie Et Le Batiment S. A., Rousset, France

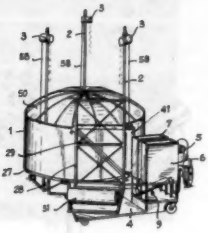
Original application Apr. 11, 1968, Ser. No. 720,710, now Patent No. 3,562,047. Divided and this application July 27, 1970, Ser. No. 58,256

Int. Cl. E04b 1/346, 1/35

U.S. Cl. 156—443 5 Claims

Cylindrical tanks and a method of and apparatus for forming such tanks from reinforced plastic material, the tanks being comprised of vertically stacked cylindrical sections.

Each cylindrical section is formed of two thicknesses of resin impregnated fabric which have been successively wound over a mandrel, the thicknesses being vertically displaced to permit overlapping at the joints between sections. As each section is completed, the mandrel is reduced in diameter and the section is raised vertically.



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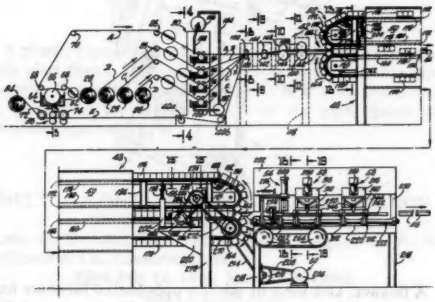
**3,652,367**

**APPARATUS FOR MANUFACTURING CORRUGATED ANGLE MEMBERS**

**Jack A. Gilbert, and Stanley Franklyn, both of Clifton, N.J., assignors to Container Company of New York, Irvington, N.J.**

**Filed Dec. 9, 1968, Ser. No. 782,209**
**Int. Cl. B31f 1/36; B22h 29/00**
**U.S. Cl. 156—463** **19 Claims**



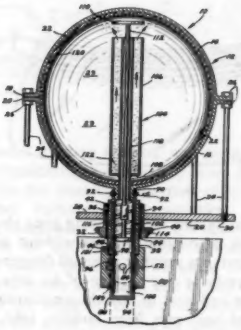
Apparatus for manufacturing corrugated angle members. These members are made of heavy paper, for example, and serve as protective reinforcements in relatively large packages containing appliances and the like, so that the corrugated angle members by engaging the appliances within the container of the package will protect the appliances against damage. A plurality of corrugated plies are glued to each other while being longitudinally angled to a gradually increasing extent by a forming means which provides the glued-together corrugated plies with a preselected angular cross section. Then the angled corrugated structure is dried while conveyed by a conveyor means through a heat tunnel. Thereafter, the corrugated structure is cut by a cutting means to preselected lengths.

**3,652,368**

**APPARATUS FOR ROTATIONAL MOLDING OF LAMINATED HOLLOW STRUCTURES**

**Jerome L. Formo, Saint Paul, Minn., assignor to Plastics, Inc., Saint Paul, Minn.**

**Filed Dec. 17, 1969, Ser. No. 885,911**
**Int. Cl. B32b 31/16**
**U.S. Cl. 156—501** **4 Claims**



Apparatus for rotational molding of laminated hollow structures from plastic material is disclosed. A first plastic material is rotationally molded to the inside surface of a hollow mold until the first plastic material is in a fused condition. A second plastic material is then released from a thermally insulated container, which may be positioned within the mold and rotated with the mold, by air pressure moving an air piston attached to a cover of the insulated container to separate the cover from the insulated container. A bond is formed between the first and second plastic materials while the second plastic material is rotationally molded to the inside surface of the first plastic material to thus laminate the two materials together. After both materials are molded, the mold is cooled, rotation of the mold is stopped, and the molded structure is removed from the mold.

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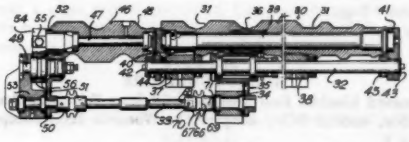
**3,652,369**

**BOTTLE FEEDING MACHINE**

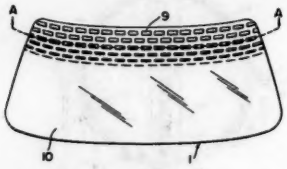
**Romuald Rene Della Vite, 10 Rue Saint-Quentin, Nogent Sur Marne, France**

**Filed Oct. 28, 1969, Ser. No. 870,049**
**Claims priority, application France, Apr. 3, 1969, 6910294**
**Int. Cl. B65c 9/02; B65g 47/26**
**U.S. Cl. 156—566** **11 Claims**



A rotary screw conveyor system for moving bottles past a turret type labelling mechanism includes two axially aligned, but independently movably mounted, rotary bodies, so that bottles of varying diameter may be accommodated without jamming the mechanism.

**3,652,370**
**DAZZLE-PREVENTING AND HEAT-BLOCKING GLASS SHEET**
**Hirokazu Motai, Nishinomiya-shi, Japan, assignor to Nippon Sheet Glass Co., Ltd., Osaka, Japan**
**Filed Oct. 7, 1969, Ser. No. 864,390**
**Claims priority, application Japan, Oct. 12, 1968, 43/89250**
**Int. Cl. B44f** *1/00*
**U.S. Cl. 161—2** **3 Claims**




A dazzle-preventing and heat-blocking glass sheet capable of allowing a view of outside objects without any trouble, said glass sheet having a number of small fragments of glass color adhered thereto at one surface of an area to be protected from dazzle and heat to absorb considerable amounts of visible rays and heat rays from outside, said glass color fragments being arranged in a spaced-apart relationship forming a pattern to allow outside objects to be viewed with sufficient clearness through the interspaces among the glass color fragments.

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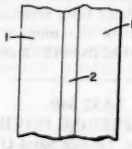
**3,652,371**
**WATER SOLUBLE PLASTIC FILM AND METHOD OF MANUFACTURING SAME**
**Kazuaki Hirata, Kurashiki, Japan, assignor to Kuraray Co., Ltd., Osaka, Japan**
**Filed Nov. 27, 1970, Ser. No. 93,265**
**Int. Cl. B29d** *7/02*; **B32b** *3/10, 3/02*
**U.S. Cl. 161—36** **6 Claims**




A composite uniplanar water soluble film comprising a strip of a cold water soluble plastic film bonded at its edge to a strip of a hot water soluble plastic film. Alternatively, there may be a plurality of cold water soluble strips and/or a plurality of hot water soluble strips constituting the uniplanar film. One of the uses of the film is in the manufacture of laundry bags.

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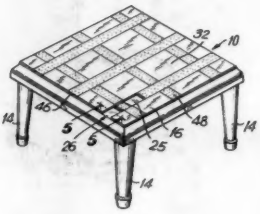
**3,652,372**
**INLAY FURNITURE**
**Leonard Klazkin, East Meadow, and Jesse Feldstein, Oceanside, both of N.Y., assignors to Woodron Inc., Freeport, N.Y.**
**Filed Jan. 26, 1970, Ser. No. 5,465**
**Int. Cl. B32b** *3/00, 3/30*; **B44c** *1/26*
**U.S. Cl. 161—39** **6 Claims**

An article of furniture includes a metal strip inlay set in a crisscross (checkerboard) pattern on an exposed substantially flat surface thereof. To receive the metal strips, an orthogonal network of mating channels is formed in the upper surface of the furniture. The channels are rectangular in cross section and arrayed with perpendicular intersections. At the intersection of any two channels, a shallow wall extends deep enough into the surface of the furniture to receive the thickness of two strips. The strips are inlaid in the channels with each strip of one piece construction for its entire length crossing several intersections. At each intersection, one of the strips has a groove to receive an overlying crossing strip whereby the exposed upper surfaces of the strips are coplanar and are flush with the exposed surface of the furniture.

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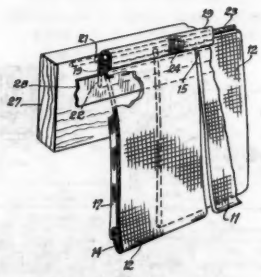
**3,652,373**
**SKIRT FOR UPHOLSTERED FURNITURE**
**Wilbur E. Noble, Warrenville, Ill., assignor to Kroehler Mfg. Co., Naperville, Ill.**
**Filed Mar. 12, 1971, Ser. No. 123,674**
**Int. Cl. B32b** *7/08, 7/06*
**U.S. Cl. 161—50** **10 Claims**




A flounce, kick pleat or skirt for upholstered furniture having simulated pleats and presenting a pleasing smooth flat tailored appearance. The flounce includes a series of front and rear panels stitched to a welt cover. The front panels are arranged in side-edge to side-edge relationship with a rear panel behind each abutment line of adjacent front panels. The welt cover is folded around a welt cord lying adjacent the upper edges of the panels and is stitched over the front panels.

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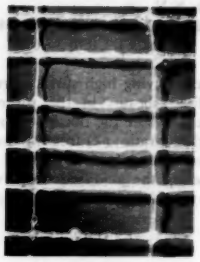
**3,652,374**
**NONBLOCKING NONWOVEN SCRIM MATERIALS**
**Eugene H. Condon, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.**
**Filed Mar. 7, 1969, Ser. No. 805,243**
**Int. Cl. D04h** *3/02, 3/12*
**U.S. Cl. 161—57** **2 Claims**

A nonwoven scrim material that may be wound up on a roll without the development of any significant degree of

blocking by employing a polyvinyl chloride plastisol adhesive fused beyond its point of residual tack and having a surface



level of plasticizer within certain critical limits, and methods for forming such materials.

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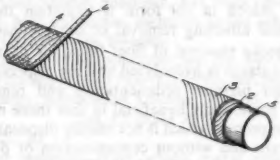
3,652,375

## PLASTIC ARTICLE HAVING ULTRAVIOLET REFLECTIVE PROPERTIES

Junior L. Johnson, Mabelvale, Ark., assignor to A. O. Smith-Inland, Milwaukee, Wis.

Filed Nov. 25, 1969, Ser. No. 879,834
Int. Cl. B32b 5/22
U.S. Cl. 161—158 4 Claims



A plastic pipe composed of thermosetting resin reinforced with glass fibers. The resin in the outer portion of the pipe contains fine mesh aluminum or other light reflective metallic powder to provide protection for the pipe against ultraviolet degradation.

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3,652,376

## MULTI-PLY PRESS PACKING FOR THE IMPRESSION MEMBER IN A LETTER PRESS

James G. Bowden, III, Weston, Mass., assignor to W. R. Grance & Co., Cambridge, Mass.

Filed July 11, 1969, Ser. No. 841,090
Int. Cl. B32b 5/18
U.S. Cl. 161—159 7 Claims

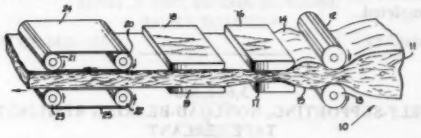
Rotary press blankets are made by laminating a highly porous, felted fibrous sheet impregnated with an elastomeric material with an an impregnated, fine-count, substantially nonstretchable textile. The fibrous layers have a residual porosity at 4 mils compression of at least about 37 percent, and the entire blanket exhibits a firmness such that a pressure of at least about 10 pounds p.s.i. must be exerted on the blanket, to produce an initial compression of 2 mils.

3,652,377

## METHOD OF FORMING FIBROUS BODIES WITH DISSIMILAR DENSITIES AND APPARATUS THEREFOR

James William Helmick, Toledo, Ohio, assignor to Johns-Manville Corporation, New York, N.Y.

Filed July 3, 1969, Ser. No. 839,027
Int. Cl. B32b 7/02
U.S. Cl. 161—166 9 Claims



A continuous forming method, and apparatus therefor, of shaping, consolidating to dissimilar internal densities, and bonding, with low density loose mass of continuously intermeshed fiber containing thermosetting binder material throughout, comprising pulling such a body of fibers through a succession of compressing and heating operations to sequentially induce the desired dissimilar densities and commensurate therewith activating and curing the binder selectively within the designed areas of dissimilar density to permanently set the same, following an initial limited binder activation to effect coherency within the loose mass to endure the pulling through the compressing operations, and the dissimilarly densified and bonded product thereof.

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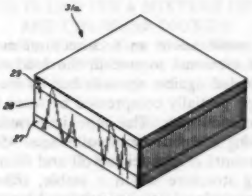
3,652,378

## STRENGTHENING ALUMINA SUBSTRATES BY INCORPORATING GRAIN GROWTH INHIBITOR IN SURFACE AND PROMOTER IN INTERIOR

Richard E. Mistler, Princeton, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Feb. 19, 1970, Ser. No. 12,666
Int. Cl. C04b 35/18, 39/12; B32b 9/00
U.S. Cl. 161—182 15 Claims



A thin ceramic substrate having unusually high strength properties is manufactured by a casting process which produces a triple layered ceramic body. The exterior layers of the body having incorporated therein a grain growth inhibitor. The interior layer of the body has incorporated therein a grain growth promoter. Upon sintering, the composite body is defined by an interior grain size which is approximately twice as large as the exterior grain size.

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3,652,379

## LAMINATED TRANSPARENT ABRASION RESISTANT ARTICLE

Ronald E. White, Romeo, and Zachariah G. Gardlund, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 7, 1969, Ser. No. 874,771
Int. Cl. B32b 17/10; C03c 27/12
U.S. Cl. 161—183 5 Claims

A transparent polycarbonate resin article, such as an automobile windshield, is prepared having a three-layer, scratch

resistant film (about 1 mil in thickness) on a surface thereof. The film contains three layers as formed; an inner layer of a suitable hydroxylated polycarbonate resin, an intermediate layer of silica and poly(vinyl butyral), and an outer layer of silica and poly(vinyl alcohol). The three layers are formed sequentially by wetting a surface of the polycarbonate body with a solution of the specific material in the first layer, evaporating the solvent to form a thin residual solid coating, and repeating this process with respect to the materials specified for the other two layers until the three-layer film is completed.

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3,652,380

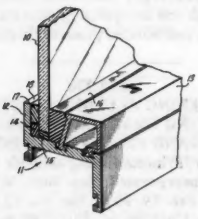
## SELF-SUPPORTING, NONLOAD-BEARING RESILIENT TAPE SEALANT

**Donald R. Strack, Dayton, Ohio, assignor to Protective Treatments, Inc., Dayton, Ohio**

**Original application Jan. 3, 1967, Ser. No. 607,022, now Patent No. 3,500,603. Divided and this application Aug. 19, 1969, Ser. No. 862,139**

**Int. Cl. B32b** *27/28;* **C08d** *9/00;* **E04b** *1/62*

**U.S. Cl. 161—255** **13 Claims**



Panels are mounted in an architectural mounting using using resilient elements to sustain the load, the supported panel being sealed against the weather by means of a self-supporting tape partially compressed between the panel and a wall of the mounting. The tape is formed of resilient elastomer having a Mooney value of at least 45 compounded with large amounts of plasticizing oil and filler to provide a self-supporting structure which is stable, adherent to glass and metal, incapable of bearing sustained loads and capable of maintaining a seal in a partially compressed condition.

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3,652,381

## METHOD OF PREPARING COLLAGEN FIBERS

**Milan Kremr, and Vaclav Hrabovsky, both of Otrokovice, Czechoslovakia, assignors to Statni vyzkumny ustav Kozedelny, Gottwaldov, Czechoslovakia**

**Filed Aug. 14, 1969, Ser. No. 850,236**

**Int. Cl. D01c** *3/00*

**U.S. Cl. 162—2** **2 Claims**

Tannery waste, such as shoulder and belly splits and glue stock, is delimed, pickled in a salt solution containing a strong acid until it loses some of its initial water content and absorbs acid, disintegrated in the presence of excess water whereby it swells to several times it original weight, and then dewatered by contact with a solution of a soluble chloride or sulfate. The partly dewatered material may then be further processed to collagen fibers by tanning and other conventional procedures.

3,652,382

## HIGH SURFACE AREA CHRYSOTILE AND METHOD OF MAKING SAME

**Alan B. Gancy, W. Acton, Mass., assignor to FMC Corporation, New York, N.Y.**

**Filed July 29, 1969, Ser. No. 845,892**

**Int. Cl. C03b** *37/00*

**U.S. Cl. 162—3** **5 Claims**

Chrysotile fibrils having high surface are obtained by (1) attriting chrysolite asbestos in the presence of sufficient dilute mineral acid to free the fibrils without significantly affecting the $SiO_2$:MgO ratio; (2) treating the freed fibrils with sufficient mineral acid to form a layer of $SiO_2$ on the fibril surface; (3) treating the acidified fibrils with alkali to dissolve the $SiO_2$ layer, and (4) washing fibrils to remove excess alkali.

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3,652,383

## TREATMENT OF PAPER COATING WASTES CONTAINING STARCH AND PIGMENT

**John Wallace de Vos, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.**

**Filed Mar. 27, 1968, Ser. No. 716,432**

**Int. Cl. D21b** *1/08, 1/32;* **D21c** *5/02*

**U.S. Cl. 162—4** **8 Claims**

The separation of starch-containing coated paper broke or coating waste material into reusable pigment and fiber constituents together with an effluent which is subject to disposal in a manner to minimize or eliminate pollution problems. The pigment is recoverable from the coating composition waste material or coated paper broke aqueous suspension by utilizing the starch in sol form to maintain the pigment dispersed while effecting removal of other constituents, in the case of broke removal of fiber fines, for example. Subsequently, the starch is hydrolyzed and the dispersion treated to provide for pigment sedimentation and removal. The procedure is particularly beneficial in that there need be no effluent of the process which is not readily disposable by conventional means and without contamination or pollution of streams which may receive the final effluent.

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3,652,384

## COUNTERCURRENT PULPING OF CELLULOSIC MATERIALS INCLUDING REGULATION OF ACTIVE CHEMICAL THEREIN

**Arthur Raymond Sloman, East Camberwell, Victoria, Australia, assignor to Associated Pulp and Paper Mills Limited, Melbourne C. I. Victoria, Australia**

**Continuation of application Ser. No. 648,257, June 23, 1967, now abandoned. This application Sept. 22, 1970, Ser. No. 74,513**

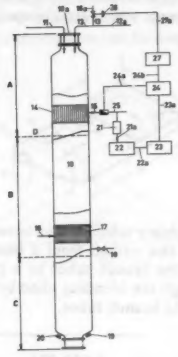
**Claims priority, application Australia, June 24, 1966, 7439/66**

**Int. Cl. D21c** *3/26, 7/12*

**U.S. Cl. 162—19** **1 Claim**

A method is disclosed for the continuous treatment of wood chips in a downflow vertical digester by the alkaline process. Wood chips and black liquor are introduced near the upper end of the digester and travel downwardly therethrough to a sole point at which the black liquor is discharged from the digester. Cooking liquor is introduced at a point between the lower end and black liquor discharge point of the digester and passes upwardly to the discharge point, countercurrent to the flow of wood chips, to cook the chips and leave the digester as back liquor at the discharge point. The cooked wood chips are removed from the lower end of the digester. The active chemical in the cooking liquor is maintained constant. Active chemical is further added near the upper end of the digester and the addition thereof is regulated in response to changes in the residual active chemical in the black liquor which are monitored at the discharge point of the digester, in order to keep the residual active

chemical in the discharged black liquor at a substantially constant concentration. The quantity of active chemical



added near the upper end of the digester does not exceed 20 percent of the total active chemical added to the digester.

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**3,652,385**

## PROCESS FOR TREATING CELLULOSIC MATERIALS FROM WHICH METAL IONS HAVE BEEN REMOVED WITH ALKALI AND OXYGEN IN THE PRESENCE OF COMPLEX MAGNESIUM SALTS

**Sture Erik Olof Noreus, Sundasen, and Hans Olof Samuelson, Goteborg, both of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden**

**Continuation-in-part of application Ser. No. 869,875, Oct. 27, 1969. This application May 12, 1970, Ser. No. 36,670**

**Claims priority, application Sweden, May 13, 1969, 6780/69**

**Int. Cl. D21c** *3/00*

**U.S. Cl. 162—23** **33 Claims**

Cellulosic materials from which metal ions have been removed by acids or complexing agents is delignified with alkali in the presence of oxygen, and particularly air, and in the presence of magnesium compounds such as, for instance, chelates of magnesium and aliphatic alpha- and beta-hydroxycarboxylic acids. The invention is of particular application to the reduction of lignin content in cellulose pulps without causing deleterious degradation of the cellulose, the magnesium compounds reducing or entirely preventing attack of oxygen on the hemicellulose and cellulose carbohydrates, without appreciably diminishing the oxidation of the lignin and its dissolution in the course of the process. The process is also useful to obtain a controlled dissolution of the hemicellulose.

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**3,652,386**

## PROCESS FOR TREATING CELLULOSIC MATERIALS WITH ALKALI AND OXYGEN IN THE PRESENCE OF COMPLEX MAGNESIUM SALTS

**Sture Erik Olof Noreus, Ornskoldsvik, and Hans Olof Smauelson, Goteborg, both of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden**

**Filed Oct. 27, 1969, Ser. No. 869,875**

**Claims priority, application Sweden, Oct. 29, 1968, 1463868**

**Int. Cl. D21c** *3/00*

**U.S. Cl. 162—65** **20 Claims**

The invention is of particular application to the reduction of lignin content in cellulose pulps without causing deleterious degradation of the cellulose, the complex magnesium salts, such as chelates of magnesium and aliphatic alpha- and beta- hydroxycarboxylic acids, reducing or entirely preventing attack of oxygen on the hemicellulose and cellulose carbohydrates, without appreciably diminishing the oxidation of the lignin and its dissolution in the course of the process.

**3,652,387**

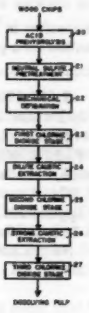
## PROCESS FOR THE MANUFACTURE OF DISSOLVING-GRADE PULP

**Harry D. Wilder, Midlothian, Va., assignor to Ethyl Corporation, New York, N.Y.**

**Continuation-in-part of application Ser. No. 797,209, Feb. 6, 1969, now abandoned , and a continuation-in-part of 830,709, June 5, 1969. This application Dec. 31, 1969, Ser. No. 889,661. The portion of the term of this patent subsequent to Nov. 3, 1987, has been disclaimed.**

**Int. Cl. D21c** *9/14*

**U.S. Cl. 162—25** **10 Claims**



Vegetable matter is treated to produce a dissolving-grade pulp, including mechanical refining of the raw material followed by, first, a lignin reaction treatment with chlorine dioxide or chlorine and chlorine dioxide and, second, an extraction treatment with a strong alkali solution such as 50 to 60 grams alkali per liter.

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**3,652,388**

## BLEACHING AND DELIGNIFICATION OF PARTIALLY DELIGNIFIED PULP WITH A MIXTURE OF CHLORINE AND CHLORINE DIOXIDE

**Ingemar Liss-Albin Croon; Sten Oskar Dillen, both of Alfredshem, and Sture Erik Noreus, Sundasen, all of Sweden, assignors to Mo Och Domsjo Aktiebolag, Ornskoldsvik, Sweden**

**Filed Dec. 5, 1969, Ser. No. 882,812**

**Claims priority, application Sweden, Dec. 5, 1968, 16678/68**

**Int. Cl. D21c** *9/14, 9/12*

**U.S. Cl. 162—65** **16 Claims**

A process is provided for bleaching and delignifying cellulose pulps that have previously been subjected to a partial delignification under alkaline conditions with an oxygen-containing gas, which comprises delignifying the pulp with a mixture of chlorine and chlorine dioxide, and then dissolving chlorinated lignin in a further alkaline treatment.

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**3,652,389**

## ADJUSTABLE FABRIC FOR USE AS A PAPERMAKING FELT WITH ZIG-ZAG PATTERNED CROSS MACHINE YARNS

**Howard M. Helland, Appleton, Wis., assignor to Appleton Mills, Appleton, Wis.**

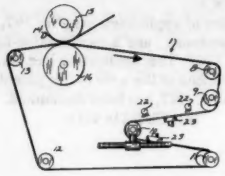
**Filed Mar. 14, 1969, Ser. No. 807,348**

**Int. Cl. D21f** *7/12;* **D03d** *25/00*

**U.S. Cl. 162—275** **15 Claims**

An endless fabric, such as a papermaker's felt, composed of a series of generally parallel warp yarns and having cross machine yarns or fibers extending in a zig-zag pattern across the warp yarns. The cross machine yarns in each section of the zig-zag pattern extend at an acute angle up to 80° with respect to a line normal to the warp yarns. The cross

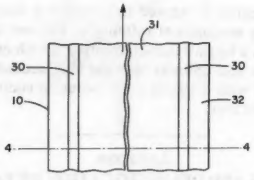
machine yarns are stabilized in their zig-zag pattern by physical or chemical means, such as by needling or heat setting, but remain adjustable thereafter in angularity with respect to the warp yarns once installed on a papermaking machine.



## 3,652,390
## PAPERMAKING DRAINAGE FABRIC AND STOCK INLET COMBINATION FOR PRODUCING EVEN EDGED PAPER WEB

LeRoy L. Peterson, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of application Ser. No. 566,281, July 19, 1966, now abandoned. This application Feb. 10, 1970, Ser. No. 10,239
Int. Cl. D21f 1/00, 1/10, 7/08
U.S. Cl. 162—303 5 Claims



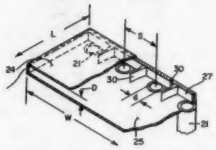
In the paper forming art an arrangement of a stock slurry inlet and a belt of drainage fabric; the drainage fabric has liquid impermeable bands positioned inwardly of its side edges and the inlet discharges the stock slurry onto the fabric including the bands. The effect of the bands is to terminate the formed paper web sidewardly along the inner edges of the bands and to provide edges of the sheet which need not be trimmed. The arrangement has particular utility where sheet formation is between two fabrics and there is little room for positioning the usual flow restricting shoes, and is advantageous also in providing for uniform basis weight across the sheet width. The liquid impermeable bands may be one-fourth to three-eighths inches in width and the side edges may be 1 to 2 inches in width.

## 3,652,391
## BOX-LIKE BLENDING CHAMBER WITH BARRIER ELEMENTS TO PRODUCE UNIFORM FLOW OF PAPERMAKING STOCK

Aris C. Spengos, Wallingford, and Richard B. Kaiser, Swarthmore, both of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Jan. 20, 1970, Ser. No. 4,225
Int. Cl. D21f 1/06
U.S. Cl. 162—343 14 Claims

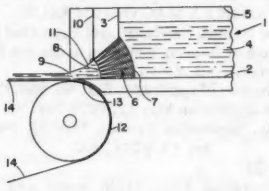
Apparatus for spreading the flow of papermaking stock so as to establish flow having uniform velocity across the width of a relatively wide conduit, which apparatus includes branch tubes for feeding the flow from a tapered header to the top or bottom wall of a boxlike blending chamber where the streams from the branch tubes impinge against the opposite wall. Barrier elements are disposed in the area of impingement in the blending chamber in a manner whereby they isolate the streams entering the blending chamber from the branch tubes so as to obtain a more uniform velocity profile. The barrier elements which are disposed between the center lines of the adjoining tubes extend between the top and bottom walls, and also extend from a point preceding the upstream side of the branch tubes to a point along the stock flow path through the blending chamber at least beyond the center lines of the branch tubes.



## 3,652,392
## CONTRACTING PRE-SLICE FLOW DISTRIBUTOR FOR PAPERMAKING MACHINE HEADBOX

David W. Appel, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 24, 1969, Ser. No. 879,251
Int. Cl. D21f 1/06
U.S. Cl. 162—343 3 Claims



An inlet for a papermaking machine characterized particularly by a stationary flow distributor immediately preceding the slice within the headbox. The distributor has an overall contracting dimension from the inlet to the outlet and is arranged to provide initially small scale turbulent mixing to attain universal fiber orientation followed by an expanding stilling section in which some turbulence is dissipated so that stock is discharged from the slice onto a forming wire with a controlled level of small scale agitation and minimum fiber alignment. The distributor has an inlet face remote from the slice which is convex in shape and a downstream outlet face which is arcuate in shape in the same sense as the inlet face. Each passageway connecting an inlet opening in the inlet face with an outlet port in the outlet face gradually widens toward the outlet port, and each passage of a vertical row of passages extends toward the slice at a different angle which is less than 45°.

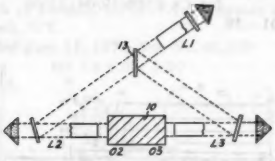
## 3,652,393
## ARRANGEMENT FOR BRINGING ABOUT NUCLEAR FUSION REACTIONS

Wolfgang Kaiser; Hans Opower, and Heinz Puell, all of Technische Hoshschule Munich, Physik Department, no. 21, Arcisstrasse, Munich, Germany

Filed Feb. 8, 1968, Ser. No. 704,026
Claims priority, application Germany, Feb. 10, 1967, K 61394
Int. Cl. G21b 1/00
U.S. Cl. 176—1 6 Claims

The invention provides an arrangement for bringing about nuclear fusion reactions comprising a known system of two synchronously activated lasers.

These lasers, facing each other on a common optic axis, emit light beams for producing a plasma. They are focused on two deuterium or deuterium-tritium containing concave or flat targets after having passed two objectives with hollow cones, which impart a tubular cross section to the light beams. Also the lasers themselves can be designed to emit tubular light beams.




The concave or flat targets having a surface roughly corresponding to the area of the focal point are disposed perpendicularly to the common optic axis of the laser system and symmetrically with respect to the center plane.

Each target is situated on that side of said plane remote from its associated objective, which has a numerical aperture of nearly 1.

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**3,652,394**

**DEVICE FOR CONTROLLING THE REACTIVITY OF NUCLEAR REACTORS**

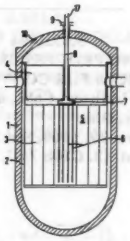
**Wolfgang Braun, Buckenhof, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany**

**Filed May 7, 1970, Ser. No. 35,312**

**Claims priority, application Germany, May 23, 1969, P 19 26 344.6**

**Int. Cl. G21c 7/08, 7/22**

**U.S. Cl. 176—86 R** **15 Claims**



Device for controlling the reactivity of a nuclear reactor cooled by light water and including a reactor core formed of fuel elements, includes a tube system passing through the reactor core and traversible by a water-soluble neutron absorber of adjustable concentration, separated by the tube system from light water coolant in the reactor core, the tube system including a plurality of substantially vertically extending fingerlike tubes always fully inserted in the fuel elements; a spiderlike holder holding the fingerlike tubes together at the upper ends thereof and serving as distributor for the neutron absorber to the fingerlike tubes, and a holder rod extending from the spiderlike distributor and serving as a central supply line for the neutron absorber to the spiderlike distributor.

**3,652,395**

**METHOD FOR THE PRODUCTION OF 5'-NUCLEOTIDES**

**Yoshio Nakao, Ibaraki, and Mitsuzo Kuno, Suita, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

**Filed Dec. 23, 1966, Ser. No. 604,199**

**Claims priority, application Japan, Dec. 25, 1965, 40/80258**

**Int. Cl. C12d 13/06**

**U.S. Cl. 195—28 N** **12 Claims**

5'-nucleotides are produced by culturing hydrocarbons-assimilating micro-organisms belonging to the genera *Corynebacterium*, *Brevibacterium*, *Pseudomonas* or *Arthrobacter* in a culture medium containing hydrocarbons as carbon sources and subsequently suspending the resultant grown micro-organisms in alkaline aqueous solution of a pH in the range of 8.0 to 10.5.

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**3,652,396**

**PROCESS FOR PREPARING CITRIC ACID BY FERMENTATION**

**Katsunobu Tanaka, and Kazuo Kimura, both of Tokyo-to, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha (Kyowa Hakko Kogyo Co., Ltd.), Tokyo, Japan**

**Filed July 18, 1968, Ser. No. 745,713**

**Claims priority, application Japan, July 21, 1967, 42/46586**

**Int. Cl. C12b 1/00**

**U.S. Cl. 195—28** **5 Claims**

A process for preparing citric acid by culturing in a culture medium containing a hydrocarbon as the principal carbon source, a fungus of the genus Penicillium having the ability to metabolize the hydrocarbon to produce citric acid as a metabolite and recovering the accumulated citric acid.

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**3,652,397**

**PREPARATION OF PHOSPHATIDES**

**Hermann Pardun, Cleves, Germany, assignor to Lever Brothers Company, New York, N.Y.**

**Filed Jan. 8, 1970, Ser. No. 1,559**

**Claims priority, application Germany, Jan. 9, 1969, P 19 00 959.7**

**Int. Cl. C12b 1/00**

**U.S. Cl. 195—30** **6 Claims**

Modified phosphatides of improved emulsifying power and suitable for use as anti-spattering agents in margarine are obtained by the partial hydrolysis of a vegetable phosphatide with an enzyme preparation containing lipase and phospholipase A until at least 2 percent and less than 15 percent of lysophosphatides are formed, and removal of free fatty acids by solvent extraction.

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**3,652,398**

**PRODUCTION OF CYCLODEXTRIN FROM GRANULAR MODIFIED STARCHES**

**Frederick C. Armbruster, La Grange, and Mukhtar Abdullah, Westmon, both of Ill., assignors to CPC International Inc.**

**Filed Dec. 20, 1968, Ser. No. 785,776**

**Int. Cl. C12b 1/00**

**U.S. Cl. 195—31 R** **14 Claims**

A process is described for the production of cyclodextrin which comprises: providing a water solution of a gelatinized granular modified starch; subjecting said solution to the action of cyclodextrin transglycosylase enzyme in the presence of a chemical selected from the group consisting of chemicals which will form a complex with cyclodextrin and mixtures thereof; and recovering a product containing cyclodextrin.

3,652,399

## ALKALI PROTEASE

Masao Isono, Nishinomiya, Hyogo; Katsumi Tomoda, Toyonaka; Kouichi Miyata, Takatsuki; Kazutaka Maejima, Hyogo, and Keisuke Tsubaki, Suita, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of application Ser. No. 795,951, Feb. 3, 1969. This application Apr. 30, 1969, Ser. No. 820,485

Int. Cl. C12d *13/10*

U.S. Cl. 195—62 2 Claims

Alkaline protease is produced by cultivating an alkaline protease-producing micro-organism from the genus *Fusarium* or *Giberella* in a proper growth supporting medium and the alkaline protease is recovered from the medium. The alkaline protease degrades protein under conditions of high pH and thus is useful in the formulation of detergent and other cleanser compositions.

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3,652,400

## PROCESS FOR THE PREPARATION OF AMYLASE

Jiro Sawada; Tetsuo Misaki; Masao Okabe; Hajime Yasui; Kazunori Hanada, and Tadayasu Okazaki, all of Tokyo, Japan, assignors to Taisho Pharmaceutical Ltd., Tokyo, Japan

Filed Mar. 4, 1966, Ser. No. 531,816

Claims priority, application Japan, Mar. 4, 1965, 40/12114

Int. Cl. C12d *13/10*

U.S. Cl. 195—66 R 8 Claims

Acid-active and acid-stable amylase having superior amylolytic activity under acidic conditions is obtained by culturing an amylase-producing micro-organism of the Paecilomyces subglobosum group in a nutrient medium therefor.

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3,652,401

## PURIFICATION OF DEXTRANASE USING IRON SALTS

Louis Chalet, Springfield, and August J. Kempf, Stanton Island, both of N.Y., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 7, 1968, Ser. No. 774,215

Int. Cl. C07g *7/02*

U.S. Cl. 195—66 R 4 Claims

Ferric chloride is added to crude dextranase containing solutions to selectively form a complex with the dextranase by adjustment of the pH, to thereby recover purified dextranase.

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3,652,402

## ASPARAGINASE HAVING ANTI-TUMOR ACTIVITY AND PROCESS FOR PREPARING THE SAME

Ichiro Chibata, Suita-shi; Tetsuya Tosa, Kyoto-shi; Ryujiro Sano, Takatsuki-shi, and Katsuko Ando, Toyonaka-shi, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Aug. 27, 1969, Ser. No. 853,496

Claims priority, application Japan, Aug. 31, 1968, 43/62674; Nov. 9, 1968, 43/82001

Int. Cl. C12d *13/10*

U.S. Cl. 195—66 A 9 Claims

Process for preparing asparaginase having a strong anti-tumor activity which comprises cultivating an asparaginase-producing micro-organism belonging to Achromobacter, Alcaligenes, Micrococcus, Proteus or Bacterium genera in a nutrient medium under aerobic conditions and recovering the accumulated asparaginase from the fermentation broth.

3,652,403

## METHOD AND APPARATUS FOR THE EVACUATION OF COKE FROM A FURNACE CHAMBER

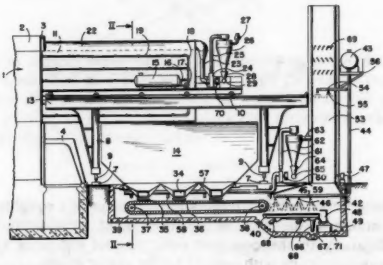
Johannes Knappstein, and Josef Stratmann, both of Recklinghausen, Germany, assignors to Firma Carl Still, Recklinghausen, Germany

Filed Nov. 28, 1969, Ser. No. 880,976

Claims priority, application Germany, Dec. 3, 1968, P 18 12 383.6; June 6, 1969, P 19 28 866.5

Int. Cl. C10b *39/04*, *33/00*

U.S. Cl. 201—39 19 Claims



A method and apparatus for the evacuation of coke from a furnace chamber and for the wet quenching of the coke includes a coke box which is mounted for movement toward and away from the horizontal coking furnace. The coke box may be moved directly adjacent the furnace battery on a track which can place the box directly in front of the door frames of the furnace chambers. The coke box is made substantially to the dimensions of the coking mass to be received and it includes a bottom closure flap which may be opened after the coke box is moved away from the furnace and over a coke bin which also has a closable upper opening which is substantially of the plan dimensions of the coke box. The coke bin has a discharge arranged in a coke discharge flue at the bottom of the coke bin and means are provided to pass the coke into a quenching chamber which is provided with a chimney for advantageously includes spray means.

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3,652,404

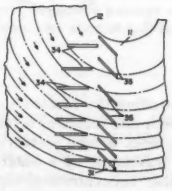
## DEVOLITILIZING PROCESS USING RABBLES AND FORMING DEVICES FOR CONVEYING MATERIALS

Robert E. Schilson, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Dec. 29, 1969, Ser. No. 888,698

Int. Cl. C10b *7/02*, *47/20*

U.S. Cl. 201—33 6 Claims



In a rotary hearth furnace utilizing rabbles to move the coke in windrows across the hearth of the furnace, a row-leveller can follow at least one of the rabbles to level off the peaks of the windrows, thus reducing maximum bed thickness and increasing heat transfer into the bed of material.

## ERRATA

For Classes 202—216 thru 208—321 see:
Patent Nos. 3,652,426 thru 3,652,452

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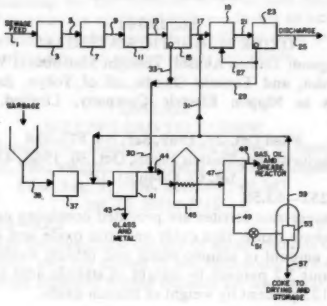
### 3,652,405
### SEWAGE AND MUNICIPAL REFUSE LIQUID PHASE COKING PROCESS

**Howard V. Hess, Glenham; Raymond F. Wilson, and Edward L. Cole, both of Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.**

**Filed June 15, 1970, Ser. No. 46,059**
**Int. Cl. C02c** *3/00*
**U.S. Cl. 210—10** **6 Claims**



A combination process for treating both municipal refuse and sewage includes the steps of shredding the solid refuse and mixing the shredded material thus obtained with a recycle stream of water resulting from a subsequent coking step to form a slurry; removing noncombustible materials from this slurry; mixing the slurry with sewage sludge and coking the resulting mixture under a pressure sufficient to prevent the vaporization of water, thereby producing grease, clean water and clean coke.

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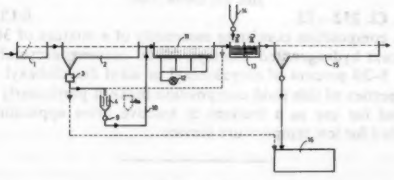
### 3,652,406
### PROCESS FOR SEWAGE TREATMENT

**Nils K. G. Westberg, Lidingo, Sweden, assignor to Aktiebolaget Vallenbyggnadsbyran, Stockholm, Sweden**

**Filed Apr. 20, 1970, Ser. No. 30,146**
**Claims priority, application Sweden, Apr. 23, 1969, 5781/69**
**Int. Cl. C02c** *1/02*
**U.S. Cl. 210—11** **3 Claims**



A process for biological treatment of sewage is disclosed, characterized by the addition of a high-activated sludge containing a culture of heterotrophical bacteria to the sewage as an inoculum, before or after the inlet of a biological oxidizing means. The high-activated sludge is produced of at least a portion of the separated primary sludge by aeration in a separate cultivating basin.

### 3,652,407
### DECOLORIZATION OF KRAFT WOOD PULP BLEACH EFFLUENTS

**Joannis Paleos, Lansdale, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.**

**Filed Oct. 28, 1969, Ser. No. 871,975**
**Int. Cl. B01d** *15/04*
**U.S. Cl. 210—27** **12 Claims**

Pulp mill bleach effluents are decolorized, after a suitable lime treatment, by acidifying to a pH of about 1–5 and thereafter passing the acidified effluent through a bed or mass of a macroreticular adsorbent resin. The macroreticular adsorbent resin may be aromatic or aliphatic in character and has a porosity of at least 10 percent and a specific surface area of at least 10 square meters per gram.

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### 3,652,408
### AN ANTIFRICTION MATERIAL

**Vasily Vladimirovich Korshak, ulitsa Gubkina, 4, kv. 81; Irina Alexandrovna Gribova, ulitsa Vavilova, 10, korpus 20, kv. 31; Alexandr Petrovich Krasnov, prospekt Kalinina, 31, kv. 28; Mikhail Mikhailovich Teplyakov, Seleznevskaya ulitsa, 13, kv. 3; Hoza Dmitrievna Fedorova, st. Petrovshoe-Razumovskoe, 1, and Alla Nikolaevna Chumaevskaya, Leninsky prospekt, 101, korpus 163, kv. 86, all of Moscow, U.S.S.R.**

**Filed Jan. 11, 1968, Ser. No. 697,024**
**Int. Cl. C10m** *5/26, 5/22*
**U.S. Cl. 252—12** **2 Claims**

Antifriction materials comprising 10–50 percent of a polybenzimidazol and 90–50 percent of a filler such as molybdenum disulfide are made by mixing the above materials in powdered form and pressing the mixture at 350–550° C. and a pressure of 800–1,000 kg./cm².

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### 3,652,409
### BEARING COMPOSITIONS

**Edward J. Mack, and Harris T. Childs, Jr., both of Bristol, R.I., assignors to Dixon Corporation, Bristol, R.I.**

**Continuation-in-part of application Ser. No. 669,674, Sept. 22, 1967, now abandoned. This application Sept. 12, 1968, Ser. No. 759,527**
**Int. Cl. C10m** *5/20*
**U.S. Cl. 252—12** **23 Claims**

In accordance with this invention there is obtained a polyimide-polytetrafluoroethylene resin composition which can be fabricated into bearings having unusually low frictional resistance.

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### 3,652,410
### MULTIFUNCTIONAL LUBRICANT ADDITIVE COMPOSITIONS AND LUBRICATING OILS CONTAINING

**Ralph Hollinghurst, Rayleigh, England, and Andrew G. Papay, Gloucester, N.J., assignors to Mobil Oil Corporation**

**Filed Apr. 30, 1969, Ser. No. 820,630**
**Claims priority, application Great Britain, May 24, 1968, 24,918/68**
**Int. Cl. C10m** *1/48*
**U.S. Cl. 252—32.7 E** **12 Claims**

Balanced oil additive compositions can be used in the engine, gears and elsewhere of mobile equipment. Appropriate concentrations of basic detergents, dispersants, antioxidants, extreme pressure agents and friction modifiers are balanced.

3,652,411

## POLYGLYCOL BASE LUBRICANT

Axel Klaus Commichau, Hamburg-Rissen, Germany, assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 4, 1969, Ser. No. 882,268
Int. Cl. C10m *1/34*
U.S. Cl. 252—34.7 10 Claims

A polyglycol base lubricant is provided containing, in minor proportion, as a stabilizer, a mixture comprising: a substituted amine, an aliphatically substituted phenol, an organic phosphate, a polyhydroxyquinone, a benzotriazole, an amine salt and a substituted organic phosphite.

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3,652,412

## PIEZOELECTRIC CERAMIC COMPOSITIONS

Masamitsu Nishida, and Hiromu Ouchi, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Aug. 28, 1968, Ser. No. 756,013
Claims priority, application Japan, Sept. 12, 1967, 42/58957
Int. Cl. C04b *35/46, 35/48*
U.S. Cl. 252—62.9 2 Claims

Ceramic materials within particular ranges of the ternary system $Pb(Li_{1/4}Nb_{3/4})O_3$-$PbTiO_3$-$PbZrO_3$ in solid solution form exhibit high dielectric constant along with high planar coupling coefficient, and are useful in electromechanical transducers. The ceramic materials are those within the area A, B, C, D, E and F and the area G, H, I, J and K of FIG. 2.

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3,652,413

## PIEZOELECTRIC CERAMIC COMPOSITIONS

Hiromu Ouchi, and Masamitsu Nishida, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Sept. 4, 1968, Ser. No. 757,338
Claims priority, application Japan, Oct. 27, 1967, 42/69770
Int. Cl. C04b *35/46, 35/48*
U.S. Cl. 252—62.9 2 Claims

Ceramic compositions within the polygonal area defined by the formulas

$$Pb(Mn_{1/3}Ta_{2/3})_{0.030}Ti_{0.470}Zr_{0.500}O_3$$

$$Pb(Mn_{1/3}Ta_{2/3})_{0.250}Ti_{0.500}Zr_{0.250}O_3$$

$$Pb(Mn_{1/3}Ta_{2/3})_{0.375}Ti_{0.375}Zr_{0.250}O_3$$

$$Pb(Mn_{1/3}Ta_{2/3})_{0.250}Ti_{0.125}Zr_{0.625}O_3$$

are particularly useful for making transducer elements.

The composition

$$Pb(Mn_{1/3}Ta_{2/3})_{0.250}Ti_{0.430}Zr_{0.320}O_3$$

shows a high resonant frequency stability with temperatures within the range from −20° to 80° C.

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3,652,414

## ANTI-SEIZE LUBRICATING COMPOUND

Frank E. Bergeron, deceased, late of 4818 Fairlawn Drive, La Canada, Calif. (by Katharine S. Bergeron, executrix)

Filed Jan. 6, 1969, Ser. No. 789,425
Int. Cl. C10m *5/22*
U.S. Cl. 252—19 12 Claims

A lubricating and sealing compound for sealing pipe threads and the like comprising: (1) 4 percent to 92.5 percent by weight of a base lubricating agent and, preferably, of a base grease produced using a soap from the group of aluminum, barium, calcium complex, lithium and sodium soaps; (2) 2 to 20 by weight of a fish oil-based lead soap; (3) 0.5 to 10 percent by weight of a sulfur modified sperm oil such as sulfurized or sulfonated sperm oil; and (4) 5 to 90 percent by weight of solids. The solids comprise either copper alone or, preferably, copper in combination with; (5) 5 to 30 percent by weight of this compound of powdered lead; and (6) 5 to 30 percent weight of amorphous graphite.

3,652,415

## LUBRICATING COMPOUND

Frank E. Bergeron, deceased, 4818 Fairlawn Drive, late of La Canada, Calif. (by Katharine S. Bergeron, executrix)

Filed Jan. 6, 1969, Ser. No. 789,424
Int. Cl. C10m *5/22*
U.S. Cl. 252—36 10 Claims

A lubricating compound for use in extreme pressure environments comprising, in one embodiment, a major amount of a base lubricating agent and a minor amount, but at least about 1 percent by weight, of a fish oil-based lead soap. The base lubricating agent includes calcium complex grease, barium grease, aluminum grease, sodium grease and lithium grease. The fish oil in the lead soap includes tuna oil, herring oil, menhaden oil and sardine oil.

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3,652,416

## OXIDE MAGNETIC MATERIALS

Izuru Sugano; Tsuneo Akashi; Tetsujin Matsubara; Yoshihiro Kenmoku, and Taneaki Okuda, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Oct. 29, 1969, Ser. No. 872,094
Claims priority, application Japan, Oct. 30, 1968, 43/79540
Int. Cl. C04b *35/38*
U.S. Cl. 252—62.59 3 Claims

Manganese-zinc ferrites are provided consisting essentially of manganese oxide, zinc oxide and iron oxide and small but effective amount of stannic oxide and lithium oxide ranging up to about 3.2 percent by weight of stannic acid and up to about 0.125 percent by weight of lithium oxide.

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3,652,417

## STABILIZATION OF ALKALI METAL PERMANGANATE IN ALKALINE SOLUTION

Hans S. Posselt, La Salle, Ill., assignor to Carus Corporation

Filed Mar. 1, 1968, Ser. No. 709,816
Int. Cl. C02b *5/02*; C11d *1/28*
U.S. Cl. 252—80 7 Claims

Stabilization of alkali metal permanganate against deoxidative, self-decomposition in aqueous, alkaline solution by preventing ultrafine (colloidal) $MnO_2$ dispersed in said solution from agglomerating by providing therein small amounts of anionic anti-coagulating agent for dispersed $MnO_2$, preferably perfluorocarbon surfactant.

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3,652,418

## TRACTIVE FLUID COMPOSITIONS

James C. Wygant, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 21, 1970, Ser. No. 39,529
Int. Cl. C09k *3/00*
U.S. Cl. 252—73 6 Claims

A composition consisting essentially of a mixture of 30–60 percent hydrogenated dicumyl, 30–60 percent tercyclohexyl and 5–20 percent of dicyclohexyl or alkyl dicyclohexyl. The properties of this fluid composition make it particularly well suited for use as a tractant in tractive drive apparatus intended for low temperature service.

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3,652,419

## ANTISTATIC FIBER LUBRICANT

Gerhart Karg, Pompton Lakes, N.J., assignor to Witco Chemical Corporation, New York, N.Y.

Filed Mar. 6, 1968, Ser. No. 710,761
Int. Cl. D06m *13/34, 13/26*
U.S. Cl. 252—8.8 2 Claims

An emulsifiable antistatic fiber lubricant composition, which exhibits excellent long term emulsion stability, comprising a mixture of a mineral oil, a methyl ester of a long chain fatty acid, a neutralized phosphoric acid ester of an

ethoxylated alkyl phenol or alkyl alcohol, a polyoxyethylene sorbitan tristearate and fatty alkanolamide.

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3,652,420

## CLEANSER COMPOSITONS FOR ARTIFICIAL DENTURES AND METHODS OF PREPARING THE SAME

William H. Hill, Stamford, Conn., assignor to Peter, Strong & Company, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 385,029, July 24, 1964, now abandoned. This application May 27, 1968, Ser. No. 732,086
Int. Cl. C11d 7/54
U.S. Cl. 252—101 14 Claims

A glass-clear gel medium is provided, in which medium free acid is distributed and which is highly effective in denture cleansing for the removal of tartar and other oral deposits. Processes are employable in producing an acidic gel in which various combination of ingredients such as acids, solvents, surfactants, and gelling agents are usable.

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3,652,421

## N-TYPE LEAD TELLURIDE

Louis F. Kendall, Jr., Scotia, N.Y., and James H. Bredt, Garrett Park, Md., assignors to General Electric Company

Filed Aug. 1, 1968, Ser. No. 749,347
Int. Cl. H01v 1/18
U.S. Cl. 252—62.3 5 Claims

It is herein disclosed that the use of small amounts of scandium, yttrium, and the metals of the lanthanide series of the rare earths are effective N-type dopants for lead telluride.

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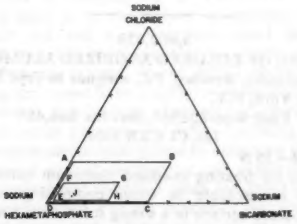
3,652,422

## CLEANER FOR WIGS

Agnes M. Hughes, 825 Michelle Drive, Everman, Tex.

Filed Aug. 5, 1970, Ser. No. 61,176
Int. Cl. C11d 7/12, 7/16; D06l 1/12
U.S. Cl. 252—135 9 Claims




A dry cleaner, and an aqueous wig cleaning solution formed by adding the cleaner to water, characterized by critical concentrations; sufficient to effect detergentless cleaning and less than that adversely affecting the hairlike fiber and backing materials of the wig; of sodium chloride, sodium bicarbonate, and sodium hexametaphosphate. No other ingredients are necessary to effect a surprisingly good cleaning solution that is also remarkably and surprisingly effective in restoring and maintaining excellent quality and body in the wig materials.

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3,652,423

## HUMIDIFIER PREPARATORY SOLUTION OF FORMALDEHYDE, POLYOXYPROPYLENE GLYCOL-ETHYLENE OXIDE CONDENSATION PRODUCT AND WATER AND METHOD OF USE

Eugene C. Roberts, 1 Sunnyside Drive, Belleville, Ill.

Filed Oct. 1, 1969, Ser. No. 862,964
Int. Cl. C02b 5/06
U.S. Cl. 252—180 7 Claims

The means for humidifying a vapor includes a humidifier having a reservoir and a wick therein. A preparatory solution adapted to be added to water within the reservoir contains between 69 percent and 94 percent by weight of water approximately 1 percent by weight of a 37 percent solution of formaldehyde, and between 5 percent and 30 percent by weight of a condensation product selected from the group of polyoxypropylene glycols condensed with ethylene oxide to form a molecule consisting of (A) a polyoxypropylene portion and (B) a polyoxyethylene portion. The ratio of the molecular weight of (A) to the percentage by weight of (B) in the total molecule is one from the group consisting of 1,501–1,800 : 80, 1,501–1,800 : 40; 1,501–1,800 : 20, and 2,101–2,500 : 80.

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3,652,424

## STABLE TOLYLENE DIISOCYANATE COMPOSITIONS

Roy Jackson, and John Francis Wehner, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 29, 1969, Ser. No. 888,925
Int. Cl. C07c 119/04; C07d 55/38; C08g 22/18
U.S. Cl. 252—182 12 Claims

A process for preparing a tolylene diisocyanate (TDI) composition containing about 5–19 percent by weight nominal TDI trimer and having improved stability by heating a TDI composition containing about 25–40 percent nominal TDI trimer and an amount of TDI dimer such that the dimer/trimer ratio is greater than about 0.14 at a temperature of at least about 130° C. until the dimer/trimer ratio is less than about 0.14 and diluting the resulting composition with a monomeric TDI composition to achieve a nominal trimer concentration of about 5–19 percent.

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3,652,425

## PROCESS FOR THE PREPARATION OF HETEROPOLY ACID COMPLEX COMPOUNDS OF METAPHOSPHORIC METASILIC ACID, METAPHOSPHORIC ACID AND PHOSPHOROUS PENTOXIDE

Harold W. Wilson, El Paso, Tex., assignor to Wilson Laboratories, Inc.

Filed Feb. 18, 1969, Ser. No. 800,292
Int. Cl. B01d 17/00; C09k 3/00
U.S. Cl. 252—194 24 Claims

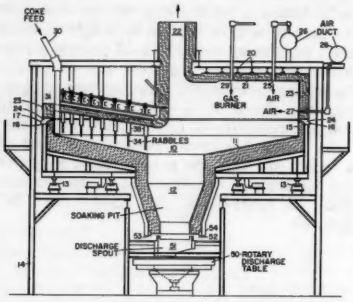
A process for the production and recovery of oxygen containing compounds of phosphorous or silicon from starting materials comprising orthophosphoric acid and amorphous silica or its hydrates by adding siliceous material to an aqueous solution of orthophosphoric acid and thereafter heating the resulting product to dissolve the added silica and then to effect volatilization and boiling off of at least some of the water of solution and combined water of hydration of said product and continuing the heating to obtain a dry solid product which is at least one oxygen containing compound of phosphorous and/or silicon.

3,652,426

## PROCESS AND APPARATUS FOR REMOVAL OF VOLATILE MATTER BY ELECTRICAL RESISTANCE HEATING

Thaddeus J. Oleszko, Neuotting, Germany, assignor to Marathon Oil Company, Findlay, Ohio

Filed Oct. 6, 1969, Ser. No. 866,790
Int. Cl. C10b *1/00, 7/20;* B01d *3/00;* H05b *11/00;* C10b *19/00;* H05b *3/60*
U.S. Cl. 202—216 13 Claims



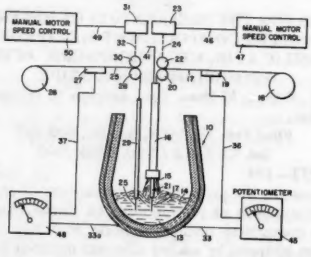

Volatile matter can be removed from material containing volatile matter removable by heat, e.g., coal and coke by delivering the material to a hearth so as to form a bed, touching the bed with downwardly projecting members disposed above the hearth, e.g., rabbles, moving the hearth and rabbles in relation to each other so as to cause movement of said material from the point of delivery of said material onto said hearth toward point of exit from said hearth, imposing an electrical potential between a point on the projecting members and a spaced point in the bed of material so as to cause heating by electrical resistance and thus remove at least a portion of the volatile matter. Preferably, the volatile matter is oxidizable and can be oxidized within a chamber enclosing the hearth so as to deliver additional heat to the bed causing additional devolatilization.

3,652,427

## METHOD FOR MONITORING THE OXYGEN AND CARBON CONTENTS IN A MOLTEN METAL

Harold W. Flood, Acton; George H. Hall, Westford, and Herman P. Miessner, Winchester, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Dec. 22, 1969, Ser. No. 886,819
Int. Cl. G01n *27/28*
U.S. Cl. 204—1 T 4 Claims



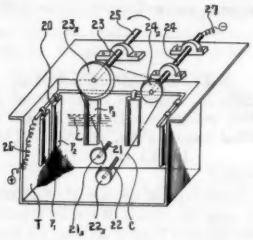

Method and apparatus for continuously measuring the oxygen and carbon contents of a molten metal, particularly of iron in a BOF furnace. A wire containing as a component a metal which is a getter for oxygen continuously fed into the melt. A concentration cell is established and the EMF developed is used as a measure of oxygen content. Carbon content is a function of the reciprocal of the oxygen and is calculated therefrom. Automatic control over the oxygen feed results in automatic control over the carbon content. When the EMF of the cell is temperature dependent, means are incorporated for simultaneously measuring the melt temperature.

3,652,428

## METHOD OF ELECTROPLATING A CHAIN

Kumakichi Araya, No. 2, Doishaji Seki-machi, Kaga-shi, Japan

Filed Apr. 26, 1968, Ser. No. 724,562
Claims priority, application Japan, Sept. 25, 1967, 42/61239; Sept. 7, 1967, 42/57000
Int. Cl. C23b *5/58, 5/48;* B01k *3/00*
U.S. Cl. 204—28 4 Claims



A method of electroplating a chain comprising electroplating the chain while making the same pass over some sprockets arranged in a plating solution. The chain may be endless for being recirculated in and out of the plating solution. The sprocket arranged in the plating solution may have an inclined shaft. A pair of the sprockets in the plating solution may have compensatingly inclined shafts for completely plating constituents of the chain along clearances formed between these constituents. Arrangements for carrying out the method are also disclosed.

3,652,429

## SEALING OF COLORED ANODIZED ALUMINUM

Emile J. Deltombe, Reading, Pa., assignor to Frye Industries, Inc., New York, N.Y.

Filed Sept. 8, 1967, Ser. No. 666,487
Int. Cl. C23f *5/04*
U.S. Cl. 204—35 N 5 Claims

A process for treating anodized aluminum colored with a dye which is insoluble in water comprising sealing the colored anodized surface in a strong solution of a neutral salt in water, which solution is held at or near its boiling point. Advantageously sodium sulfate is used as the neutral salt.

3,652,430

## ELECTROLYTIC CONDENSATION OF CARBOXYLIC ACIDS

Fritz Beck, Ludwigshafen; Walter Himmele, Walldorf; Juergen Haufe, Lambsheim, and Andreas Brunold, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 8, 1968, Ser. No. 774,415
Claims priority, application Germany, Nov. 11, 1967, P 16 43 693.4
Int. Cl. B01d *3/00*
U.S. Cl. 204—72 7 Claims

Process for the electrochemical condensation of carboxylic acids by the electrolysis of monocarboxylic acids, half esters of dicarboxylic acids or aminocarboxylic acids in which cur-

rent densities of more than 10 amp./dm.$^2$ on vibrating electrode pairs are used, and in which the degree of neutralization of the carboxylic acids is kept below 10 percent, said process providing high space-time yields and a reaction product which can be worked up without difficulty.

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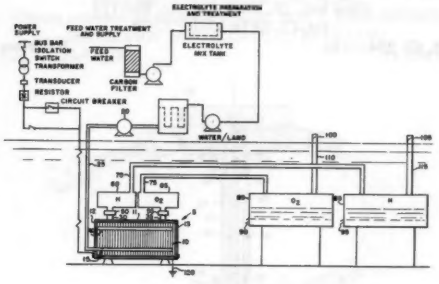
## 3,652,431
## METHOD OF OPERATING AN ELECTROLYSIS CELL FOR THE PRODUCTION OF GASES UNDER HYDROSTATIC PRESSURE

**Julian Louis Reynolds, 5511 Cary Street Road, Richmond, Va.**

**Continuation-in-part of application Ser. No. 503,693, Dec. 23, 1965, now abandoned. This application Mar. 12, 1970, Ser. No. 18,933**

**Int. Cl. C01b** *13/06;* **H01m** *1/00*

**U.S. Cl. 204—129** **3 Claims**




A method of carrying out an electrolytic process for producing gases in an electrolyzer comprising at least one electrolytic cell and a containment vessel therefor, said method comprising supplying electric power to said electrolyzer from an external source during operation thereof, subjecting said vessel to an external superatmospheric hydrostatic pressure, continuously charging said electrolyzer with electrolyte under pressure and while operating pressure of the continuous electrolytic system by collecting the produced gases external to said electrolyzer and external hydrostatic pressure against said collected gases generated and being in fluid communication with the interior of said electrolyzer so that said internal and external pressures are approximately the same during said operating.

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## 3,652,432
## METHOD FOR PREVENTING CAUSTIC SPRAY IN ELECTROCHEMICAL CLEANING

**Isidore Pollack, Westminister, and Charles L. Dohogne, San Pedro, both of Calif., assignors to Purex Corporation, Ltd., Lakewood, Calif.**

**Filed Oct. 15, 1969, Ser. No. 866,728**

**Int. Cl. C23b** *1/04;* **C03c** *23/00*

**U.S. Cl. 204—141** **6 Claims**

Throwing of caustic solution into the air over electrochemical cleaning baths by evolved hydrogen is prevented by addition of trisodium hydroxyethylethylenediamine triacetate to the bath to form a blanket of foam on the bath during electrochemical cleaning operation.

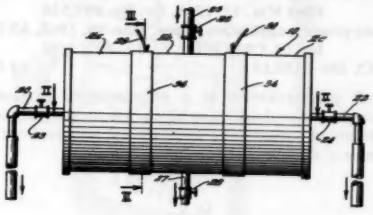
## 3,652,433
## ELECTROLYTIC SOFTENING OF WATER

**Ralph Brewster Thompson, Oak Brook, Ill., assignor to Nalco Chemical Company, Chicago, Ill.**

**Filed Oct. 9, 1968, Ser. No. 766,050**

**Int. Cl. C22d** *1/02*

**U.S. Cl. 204—152** **4 Claims**



A method of deionizing water having a dissolved solids content consisting largely of relatively insoluble calcium and magnesium salts by passing through the water a unidirectional electric current of sufficient voltage between electrodes immersed in the water to effect ionization thereof and recovering water substantially deionized and of a lesser degree of hardness. The electrolytic system includes a horizontally disposed container, preferably of dielectric structural material, for the feed water, horizontally spaced electrodes in the container between which the feed water is introduced and controlled means for removing substantially deionized water laterally of the electrodes and other controlled means for removing settled solids from below the space between the electrodes. The anode electrode is inert toward electrolytic action, while the cathode electrode need not be inert since under the conditions of operation it is not substantially corroded.

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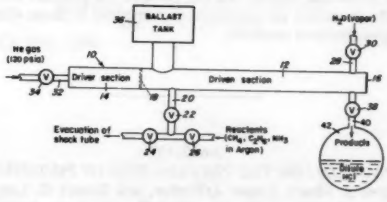
## 3,652,434
## PRESSURE WAVE SYNTHESIS OF AMINOCARBOXYLIC ACIDS

**Akiva Bar-Nun, Palo Alto, Calif.; Simon H. Bauer, and Carl Sagan, both of Ithaca, N.Y., assignors to Cornell Research Foundations, Inc., Ithaca, N.Y.**

**Filed Oct. 2, 1970, Ser. No. 77,619**

**Int. Cl. B01j** *1/12;* **C07c** *99/00, 101/50*

**U.S. Cl. 204—158 S** **10 Claims**




A homogenous vapor phase method for preparing aminocarboxylic acids by subjecting a gaseous mixture of compounds containing the elements hydrogen, oxygen, carbon and nitrogen (with the latter two in reduced compounds), which are optionally mixed in an inert carrier gas to pressure wave heating and rapid expansion wave cooling. The products from the heating and cooling process are immediately withdrawn from the reaction chamber into a dilute aqueous solution of a mineral acid wherein the aminocarboxylic acids produced from the process are recovered.

3,652,435

## PROCESS FOR GRAFT POLYMERIZATION OF POLYMERIZABLE MONOMERS TO POLYETHYLENE TEREPHTHALATE IN PRESENCE OF A CARBON OR SILICON HALIDE

Ichiro Sakurada, Kyoto-shi, Kyoto-fu, and Toshio Okada, Moriguchi-shi, Osaka-fu, both of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Mar. 17, 1969, Ser. No. 807,938
Claims priority, application Japan, Mar. 19, 1968, 43/17842
Int. Cl. C08g *39/10, 51/30;* B01j *1/10*
U.S. Cl. 204—159.15 14 Claims

Graft polymerization of a polymerizable monomer to polyethylene terephthalate or to a polyester polymer consisting mainly of polyethylene terephthalate is carried out in the presence of a halide of the general formula

$$M_nX_{2n+2}$$

wherein M is carbon or silicon, X is halogen and *n* is a positive integer.

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3,652,436

## METHOD FOR POLYMERIZING TETRAOXANE

Yoshiaki Nakase; Masaru Yoshida; Akihiko Ito, all of Takasaki-shi, and Seizo Okamura, Kyoto-shi, all of Japan, assignors to Mitsubishi Petrochemical Company Ltd., Tokyo and Ube Industries, Ltd., Ube-shi, Yamaguchi-ken, Japan

Filed Oct. 20, 1969, Ser. No. 867,933
Claims priority, application Japan, Sept. 6, 1969, 44/70674
Int. Cl. C08g *1/00, 11/00*
U.S. Cl. 204—159.21 13 Claims

Method for polymerizing tetraoxane by carrying out the polymerization at temperatures above 60° C. and in the presence of at least one hydrocarbon halide of the general formula $RX_n$, wherein R is a radical having one to 15 carbon atoms, and may be a saturated or unsaturated aliphatic or alicyclic hydrocarbon residue, with different substituents for hydrogen in the hydrocarbon residue, X may be F, Cl, Br, or I, and n a positive integer not exceeding 10. The polymerization reaction can be promoted by ionizing irradiation either before or after hydrogen halides are added to the tetraoxane. The molecular weight and the yield of the polymer obtained by the invention are increased as compared to those obtained by conventional methods.

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3,652,437

## PROCESS FOR THE PREPARATION OF PHOSPHINE

Eugene J. Mezey, Upper Arlington, and Robert G. Laughlin, Springfield Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 25, 1969, Ser. No. 861,154
Int. Cl. C01b *25/06;* B01k *1/00*
U.S. Cl. 204—164 13 Claims

A process for preparing phosphine from elemental phosphorus and hydrogen using a plasma stream of electronically excited hydrogen is disclosed. Phosphine is useful as a fumigant and as an intermediate in the preparation of tetrakis(hydroxymethyl)phosphonium chloride, used to impart fire retardancy to fabrics.

3,652,438

## PHOTOELECTROPHORETIC IMAGING PROCESS USING DIVALENT HEAVY METAL SALTS OF 1(1'-SULFO-2-NAPHTHYLAZO)-Z-NAPHTHOLS AS IMAGING MATERIAL

Freeman B. Jones, Jr., East Lansing, Mich., assignor to Xerox Corporation, Rochester, N.Y.

Original application Feb. 1, 1967, Ser. No. 613,295, now Patent No. 3,574,182. Divided and this application May 21, 1970, Ser. No. 48,595
Int. Cl. G03g *13/22;* B01k *5/02*
U.S. Cl. 204—181 11 Claims

New compositions consisting of a group of metal salts of 1(1'-sulfo-20'-naphthalazo)-2-naphthols. Also, photoelectrophoretic imaging processes using these compositions are described.

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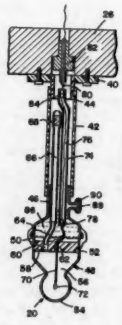
3,652,439

## APPARATUS FOR MEASURING PH IN HIGH-PRESSURE ENVIRONMENTS

Shmuel Ben-Yaakov, Beverly Hills, and Isaac R. Kaplan, Sherman Oaks, both of Calif., assignors to The Regents of the University of California

Filed Feb. 28, 1969, Ser. No. 803,173
Int. Cl. G01n *27/30, 27/36*
U.S. Cl. 204—195 8 Claims




Continuous direct measurement of pH at great depths in the ocean from a surface vessel is accomplished by a cable-supported probe which measures the electric potential between an Ag/AgCl/glass membrane electrode and an Ag/AgCl reference electrode immersed in a reference solution in contact with the sea water; converts the measured potential into a variable-frequency signal in situ; and transmits the signal to readout equipment at the surface. The ruggedness and simplicity which make the device suitable for routine field use at great depths are achieved by pressure equalization in the electrode structures through membrane arrangements while maintaining high electrode insulation levels; by a simplified method of electrode preparation; by remote switching and calibrating of the pH sensor and associated temperature and pressure sensors; and by a simplified analog-to-frequency converter.

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3,652,440

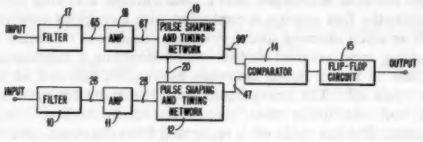
## SPARK SENSING SYSTEM FOR ECM APPARATUS

Gareth A. Dehner, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Nov. 12, 1968, Ser. No. 774,812
Int. Cl. B01k *3/00;* B23p *1/04*
U.S. Cl. 204—228 11 Claims

A sensing system responds only to high frequency voltages

created by sparks to shut down an electrochemical machining apparatus. The system includes means to prevent shutting down of the apparatus due to noise.

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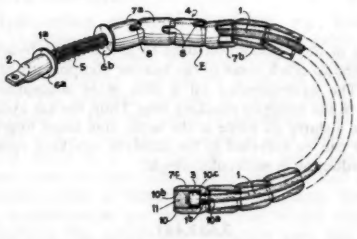
**3,652,441**

**ELECTRODE FOR AN ELECTROPHORESIS PAINTING INSTALLATION**

**Raymond Esselin, Valentigney, and Jean-Claude Poirier, Grand-Charmont, both of France, assignors to Automobiles Peugeot, Paris and Regie Nationale Des Usines Renault, Billancourt, France**

**Filed Apr. 21, 1970, Ser. No. 30,537**
**Claims priority, application France, May 7, 1969, 6914555**
**Int. Cl. B01r** *3/02*; **C23b** *5/72*; **B01d** *15/02*
**U.S. Cl. 204—280** **11 Claims**



An electrode, in particular for an electrophoresis painting installation. The metal conductor has threaded thereon a row of rigid beads constituting a flexible insulating sheath. The beads are maintained at both ends of the conductor in such manner that they are constantly in contact with each other. At least some of the beads have passages putting the conductor in communication with the exterior of the sheath.

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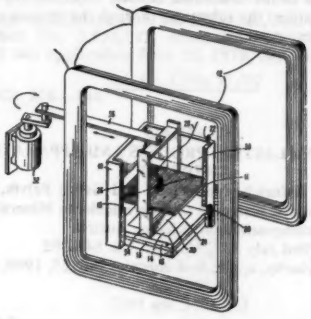
**3,652,442**

**ELECTROPLATING CELL INCLUDING MEANS TO AGITATE THE ELECTROLYTE IN LAMINAR FLOW**

**John V. Powers, Shenorock, and Lubomyr T. Romankiw, Millwood, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation-in-part of application Ser. No. 693,375, Dec. 26, 1967, now abandoned. This application Apr. 6, 1970, Ser. No. 25,708**
**Int. Cl. B01k** *3/00*
**U.S. Cl. 204—273** **5 Claims**

An electroplating cell is constructed to prevent current spreading in the electrolyte during the plating of a metal or metal alloy onto a substrate. The cell is constructed such that the cross-sectional area of current path is substantially the same as the cross-sectional area of a pair of electrodes spaced apart in the cell. This is accomplished by placing the electrodes in the cell such that their edges are substantially in contact with the dielectric or insulating walls of the cell. The cell also contains electrolyte agitating means to provide uniform laminar flow of the electrolyte across the surface of one of the electrode. Metal alloy films deposited with the use of this cell exhibit uniform thicknesses on rather large surface areas. Where magnetic metal alloys are plated, the films not only exhibit uniform thicknesses laterally on the whole cathode but uniform composition and magnetic properties throughout as well.



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**3,652,443**

**DEPOSITION APPARATUS**

**Frank H. Fish, Westwood, and Edward P. McLaughlin, Braintree, both of Mass., assignors to The Gillette Company, Boston, Mass.**

**Filed Aug. 25, 1970, Ser. No. 66,842**
**Int. Cl. C23c** *15/00*
**U.S. Cl. 204—298** **14 Claims**

Deposition apparatus includes a vacuum chamber with a target, a substrate holder and a screen disposed in the chamber. The screen has graduated transparency and is disposed between the target and the substrate holder. Material is transferred from the target through the screen to a substrate on the holder and the graduated transparency of the screen is coordinated with the transfer process so that the thickness of the film deposited on the substrate is substantially uniform.

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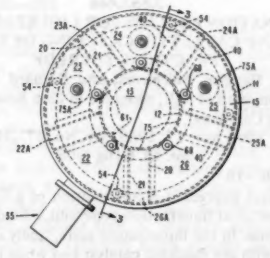
**3,652,444**

**CONTINUOUS VACUUM PROCESS APPARATUS**

**William C. Lester, Hopewell Junction; Carlo Nuccio, Poughkeepsie, and Ernest S. Ward, Fishkill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 24, 1969, Ser. No. 869,295**
**Int. Cl. C23c** *15/00*
**U.S. Cl. 204—298** **13 Claims**



The invention is directed to a continuous vacuum multiprocessing system for treating, evaporation, or sputter vacuum depositing on a substrate or wafer for the prepara-

tion of semiconductors. The utilized structure comprises an annular chamber partitioned into alternating process and isolation compartments which are circularly arranged around a common (central) vacuum manifold. A circular transport ring, confined to the evacuated annular mechanically transports (via rotation) the substrates through the various serially connected compartments.

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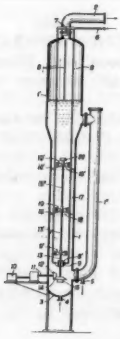
3,652,445

## BITUMEN BLASTING PROCESS AND APPARATUS THEREFOR

Hans Senolt; Heinrich Tomaschko, and Georg Palvik, all of Vienna, Austria, assignors to Osterreichische Mineralolverwaltung Aktiengesellschaft, Vienna, Austria

Filed July 23, 1969, Ser. No. 843,955
Claims priority, application Austria, July 25, 1968, A 7211/68
Int. Cl. C10g *1/00*
U.S. Cl. 208—6 2 Claims



Soft asphalt is hardened by passing a stream of air into and through the asphalt in a molten state. The air stream forms air bubbles which rise through the asphalt. The air bubbles are forcibly coalesced into air sacs and the air sacs are redispersed into air bubbles. The air bubbles may be coalesced into air sacs and redispersed more than once.

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3,652,446

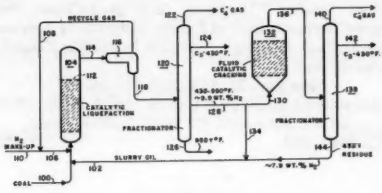
## COMBINATION PROCESS FOR LIQUEFACTION OF COAL AND CATALYTIC CRACKING OF SELECTED FRACTIONS THEREOF

Herbert P. Dengler, Fairhaven, and Bernard L. Schulman, Livingston, both of N.J., assignors to Esso Research and Engineering Company

Filed Nov. 17, 1969, Ser. No. 877,314
Int. Cl. C10g *1/08*
U.S. Cl. 208—10 9 Claims

The present process is a combination of a liquid fluidized bed catalytic coal liquefaction zone and a fluidized catalytic cracking zone. In the liquefaction zone, finely divided coal is contacted with the fluidized catalyst bed while in a solvent oil and in contact with molecular hydrogen. A liquefaction zone product stream, containing a substantial amount of liquid materials boiling in an intermediate temperature range (e.g., 430° F. to 950° F.), is obtained, and boiling intermediate boilding range material separated from the remainder of the product stream. A first portion of the intermediate boiling range material is charged into a fluid catalyst cracking zone wherein the first portion is contacted with a cracking catalyst such as silica alumina under cracking conditions to obtain a cracking zone product stream which contains a substantial amount of heavy liquid materials hereinafter referred to as "cat cycle oil." The heavy liquid materials in the cat cycle oil will boil not lower than the intermediate boiling range material. The cat cycle oil is separated from the remainder of the cracking zone product stream and admixed with a second portion of the intermediate boiling range material to obtain the slurry oil used as a solvent oil in the liquefaction zone.

By the present process, the cat cycle oil, which is very refractory due to a low hydrogen content, is reacted with




hydrogen in the liquefaction zone to increase the hydrogen content and to crack some of the heavier components of that stream. The hydrogenated oil is also more susceptible to cracking in the catalytic cracking step. Thus, the cat cycle oil is used as a slurry oil while at the same time being upgraded so that it can be recycled to the catalytic cracking zone for further reduction in molecular weight.

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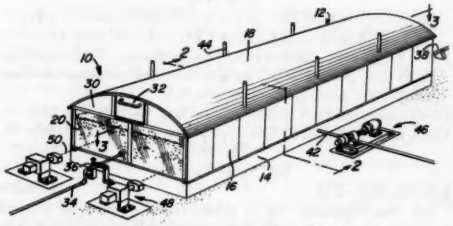
3,652,447

## PROCESS FOR EXTRACTING OIL FROM OIL SHALE

Milfred R. Yant, Laredo, Tex., assignor to Samuel S. Williams, Laredo; Samuel Herrmann and Cleo Herrmann, El Paso, Tex., part interest to each

Filed Apr. 18, 1969, Ser. No. 817,418
Int. Cl. C10g *1/02*; C10b *53/06*
U.S. Cl. 208—11 11 Claims



Pyrolytic recovery of shale oil by passage of pulsed, laser beams through a body of crushed shale housed in an enclosure from which gaseous products are withdrawn by a vacuum pump. Operation of the vacuum pump is synchronized with the laser generators to generate negative pressure pulses between the energy pulsations of the laser beams.

3,652,448

## PRODUCTION OF IMPROVED LUBRICATING OILS

Billy H. Cummins, Nederland, Tex., assignor to Texaco Inc., New York, N.Y.

No Drawing. Filed June 30, 1969, Ser. No. 837,930

Int. Cl. C10g *13/00*

U.S. Cl. 208—87 9 Claims

Lubricating oils of improved color, viscosity index and stability towards ultraviolet light are obtained by a processing sequence involving in a specific embodiment solvent refining a lube oil stock, hydrocracking the solvent refined material and subjecting the hydrocracked product to a second solvent refining. Superior results are obtained using N-methyl-2-pyrrolidone as the solvent.

3,652,449

## HYDROCARBON CONVERSION PROCESSES USING ALUMINA-BONDED CATALYSTS

Dean Arthur Young and Grant A. Mickelson, Yorba Linda, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Continuation-in-part of application Ser. No. 713,993, Mar. 18, 1968, now Patent No. 3,557,024. This application June 24, 1970, Ser. No. 49,584

Int. Cl. C10g *13/02, 23/00*

U.S. Cl. 208—111 17 Claims

Hydrocarbon conversion processes, e.g., hydrocracking, hydrofining and the like, use highly stable catalysts prepared from siliceous materials such as aluminosilicate zeolites employing acid-treated boehmite alumina as a binder. The boehmite alumina is treated with at least 0.5 equivalent of acid per mole of boehmite. The acid employed in the treatment is a mineral acid having a monovalent anion or a salt thereof, e.g., nitric acid, hydrochloric acid or their salts. These catalysts find utility in processes such as cracking, hydrocracking, hydrotreating, isomerization and the like. The binder composition comprising the acid-treated boehmite may also be used for binding a variety of siliceous compositions such as amorphous combinations of silica and alumina, activated clays and silica gel.

3,652,450

## FLUID DISTRIBUTION FOR FLUID-SOLIDS CONTACTING CHAMBERS

David M. Boyd, Clarendon Hills, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Original application Dec. 20, 1968, Ser. No. 785,666, now Patent No. 3,556,736, dated Jan. 19, 1971. Divided and this application June 15, 1970, Ser. No. 46,237

Int. Cl. C10g *37/02*

U.S. Cl. 208—146 8 Claims

Method and apparatus for contacting two fluids in a fluid-solids contacting zone such as an adsorption zone or a reaction zone. A first fluid is passed downwardly into a distributor downcomer and a second fluid is passed upwardly into the downcomer via an inlet nozzle contained within the downcomer. A resulting mixture of first and second fluid passes downflow through the annulus confined between the downcomer wall and the inlet nozzle, and enters a bed of particulated solids below. The method and apparatus are also applicable to upflow processing through beds of particulated solids. Specific application is in hydrogenation, hydrotreating, hydrocracking, and hydrodealkylation reaction zones, wherein a hydrogen stream is utilized for the thermal quench of reactant hydrocarbon between catalyst beds.

3,652,451

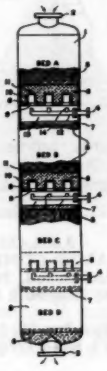
## FLUID DISTRIBUTION FOR FLUID-SOLIDS CONTACTING CHAMBERS

David M. Boyd, Clarendon Hills, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Original application Dec. 20, 1968, Ser. No. 785,667, now Patent No. 3,556,737, dated Jan. 19, 1971. Divided and this application June 15, 1970, Ser. No. 46,347

Int. Cl. C10g *37/02*

U.S. Cl. 208—146 8 Claims



Method and apparatus for contacting two fluids in a fluid-solids contacting zone, such as an adsorption zone or a reaction zone. A first fluid is discharged downwardly from a passageway spaced above a bed of particulated solids. From a nozzle spaced below the passageway, a second fluid is discharged upward into the first fluid discharged in a manner sufficient to produce a spray of mixed first and second fluid which passes into the bed below. Specific application is in hydrogenation, hydrotreating, hydrocracking, and hydrodealkylation reaction zones, wherein a hydrogen stream is utilized for the thermal quench of reactant hydrocarbon between catalyst beds.

3,652,452

## SOLVENT RECOVERY PROCESS

Volker W. Eyermann, Houston, Tex., assignor to Universal Oil Products Company, Des Plaines, Ill.

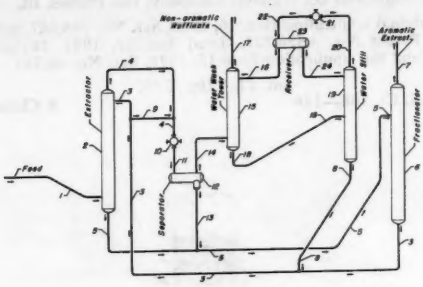
Filed Nov. 28, 1969, Ser. No. 880,656

Int. Cl. C10g *21/28*

U.S. Cl. 208—321 9 Claims

Process for recovery of primary solvent contained in a raffinate stream produced by a primary extraction process, wherein cooling of the raffinate stream inherently produces a relatively stable mist of free primary solvent phase in the raffinate, and said mist interferes with extraction of primary solvent from the raffinate in a subsequent secondary extraction zone utilizing a secondary solvent. The process comprises mixing and cooling the raffinate stream with a stream of primary solvent in a conditioning zone under conditions sufficient to produce a conditioned raffinate free of primary solvent mist and thereby render the raffinate more readily extractable in the secondary extraction zone. The process has particular application where the primary extraction process is an aromatics extraction process, the raffinate comprises non-

aromatic hydrocarbons, the secondary extraction zone is an aqueous extraction zone, and the secondary solvent comprises water. Primary solvents recoverable within the




scope of the inventive process include sulfolane-type chemicals, sulfolene chemicals, polyethylene glycols, polypropylene glycols, dimethyl sulfoxide, etc.

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3,652,453

## DEFOAMER COMPOSITION

Thomas Francis MacDonnell, Newfoundland, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

No Drawing. Filed Jan. 27, 1970, Ser. No. 6,296
Int. Cl. B01d *17/00, 19/00*
U.S. Cl. 252—358 12 Claims

Defoamer compositions are prepared using certain amides and/or hydrocarbon waxes, oil soluble organic polymers, and an inert liquid vehicle, by means of a quick-chilling process. Optionally, castor oil, silicone oil, water, an alkylene oxide-castor oil reaction product, a high molecular weight sulfonated naphthalene condensate, and an emulsifier may be present. The compositions may be used for defoaming and/or preventing foam in other than hydrocarbon oil base systems.

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3,652,454

## HIGH PRESSURE WATER-GAS SHIFT CONVERSION PROCESS

Allen M. Robin, Claremont, and Joseph P. Tassoney, Whittier, Calif., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed May 27, 1968, Ser. No. 732,074
Int. Cl. C01b *1/08*
U.S. Cl. 252—373 2 Claims

High pressure continuous catalytic water-gas shift conversion process in which CO conversion is maximized and an effluent gas stream comprising essentially $H_2$ and $CO_2$ is produced having a substantially constant composition at all times throughout the life of the catalyst. Process design and operation are optimized to yield an overall CO conversion of about from 80 to 98 mole percent over a period of two years or more on stream. Steam and a CO containing gaseous feedstream are reacted in an adiabatic catalytic reaction zone comprising one or more fixed beds of iron-chromium oxide catalyst connected in series and provided with interbed cooling. The catalyst is characterized by its activity increasing as a function of pressure over the operating range of about 35 to 250 atmospheres. This is contrary to the present general idea that the activity of an iron oxide shift catalyst levels out at about 400 p.s.i.g. The temperature of the gases leaving each bed is maintained in the range of about 30° F. to 100° F. less than the corresponding equilibrium temperature and to offset catalyst deactivation the inlet and exit temperatures of the gas stream in each bed is increased as a logarithmic function of time on stream.

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3,652,455

## PROCESS FOR REGENERATING A HYDRATION CATALYST

Herbert Baader, Hermulheim, near Cologne, and Wolfgang Opitz and Armin Jacobowsky, Knapsack, near Cologne, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany

No Drawing. Filed Apr. 17, 1970, Ser. No. 29,636
Claims priority, application Germany, Apr. 24, 1969, P 19 20 805.0
Int. Cl. B01j *11/18*
U.S. Cl. 252—415 4 Claims

A catalyst comprising metallic palladium deposited on a silica gel or active carbon carrier for use in the hydration and dechlorination of dichloroacetic acid and/or trichloroacetic acid to produce monochloroacetic acid and/or acetic acid is regenerated. To this effect, the poisoned catalyst is subjected in the hydration zone itself at temperatures of between 50 and 200° C. to treatment with dry chlorine gas until it is saturated, and the hydration zone is exhausted under a pressure of between about 500 and 750 mm. mercury.

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3,652,456

## MULTIFUNCTIONAL POLYMERIZATION INITIATORS FROM ALLYL-SUBSTITUTED TERTIARY AMINES

Floyd E. Naylor, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed June 9, 1969, Ser. No. 831,753
Int. Cl. C07f *1/02*
U.S. Cl. 252—431 5 Claims

A multifunctional polymerization initiator is formed on admixing an allyl-substituted tertiary amine and organomonolithium compound, optionally with the further addition of a solubilizing monomer.

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3,652,457

## HYDROTHERMAL METHOD OF MANUFACTURING A HYDROCARBON CONVERSION CATALYST CONTAINING AT LEAST ONE HYDROGENATING COMPONENT, AND THE CATALYST SO MANUFACTURED

Joseph Jaffe, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Sept. 30, 1968, Ser. No. 763,922
Int. Cl. B01j *11/78, 11/40*
U.S. Cl. 252—442 13 Claims

Hydrothermal conversion method for manufacturing a hydrocarbon conversion catalyst comprising at least one hydrogenating component in intimate admixture with a layered synthetic crystalline clay-type aluminosilicate component, said intimate admixture being a result of forming said aluminosilicate component in the presence of a precursor of said hydrogenating component, from precursors of said aluminosilicate component, under conditions of elevated temperature and pressure, and catalyst so manufactured.

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3,652,458

## HYDROGENATION CATALYSTS COMPRISING NICKEL OR COPPER DEPOSITED ON SILICA

Georges Gobron, Melle, France, and Marcel Motillon, deceased, late of Melle, France, by Jacqueline Sudan, Caluire, Colette Viaud, Melle, and Jeannine Motillon and Michel Motillon, Caluire, France, legal heirs

Continuation-in-part of application Ser. No. 626,964, Mar. 30, 1967. This application Nov. 7, 1969, Ser. No. 874,877
Int. Cl. B01j *11/22, 11/40*
U.S. Cl. 252—454 4 Claims

This disclosure describes hydrogenation catalysts comprising nickel or copper deposited on a highly pure silica carrier. The catalysts are prepared by reaction between

a water soluble salt of the metal and an alkaline reagent such as sodium hydroxide in water. The insoluble metallic compound which precipitates is washed and dried. It is then reduced with hydrogen at an elevated temperature.

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**3,652,459**
**HYDROCRACKING CATALYST**
**R. Parthasarathy, Silver Spring, and Julius Scherzer and John L. Warthen, Baltimore, Md., assignors to W. R. Grace & Co., New York, N.Y.**
**No Drawing. Filed Feb. 25, 1970, Ser. No. 14,231**
**Int. Cl. B01j *11/40*; C01b *33/28***
**U.S. Cl. 252—455 Z** **3 Claims**

A nickel oxide promoted hydrocracking catalyst having a base consisting of partially chromium exchanged calcined faujasite combined with an inorganic matrix. The activity of the catalyst remains essentially constant over extended periods of use.

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**3,652,460**
**METHOD FOR THE PREPARATION OF A CYCLOHEXANOL-TO-CYCLOHEXANONE DEHYDROGENATION CATALYST**
**Nester Petrovich Emelyanov, Ulitsa Kavaleriiskaya 10, kv. 4; Rogneda Ivanovna Belskaya, Ulitsa Ya. Kolosa 26, kv. 27; and Rostislav Yakovlevich Semyachko, Melnichny pereulok 17, kv. 2, all of Minsk, U.S.S.R.**
**No Drawing. Filed Oct. 31, 1969, Ser. No. 873,095**
**Int. Cl. B01j *11/00***
**U.S. Cl. 252—475** **10 Claims**

A process of preparing a catalyst for cyclohexanol dehydrogenation to cyclohexanone which comprises impregnating zinc oxide with a solution of cupric nitrate, followed by treating the resultant mass with a solution of oxalic acid and thereafter with hydrogen.

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**3,652,461**
**CARBON BLACK DISPERSIONS, THEIR PREPARATION AND PRODUCTS THEREFROM**
**Harold R. Dalton, 931 Rydal Road, Jenkintown, Pa. 19046**
**No Drawing. Continuation-in-part of application Ser. No. 502,614, Oct. 22, 1965. This application Nov. 10, 1969, Ser. No. 875,591**
**Int. Cl. H01b *1/06*; C08h *17/08***
**U.S. Cl. 252—511** **17 Claims**

A dispersion of carbon black particles is dispersed, and has on their surfaces as an adsorbate a mono-layer of an organic resin adsorbed from its solution, in a readily volatile organic solvent for the resin. The solvent and the adsorbate are compatible with (a) solvent used for making with a film-forming resin (differing from the adsorbate) a solution for preparing an electric-signal-responsive film for a recording blank, and (b) the film-forming resin. The dispersion is prepared by (i) milling the carbon black particles with solution of the organic resin adsorbate in its solvent and (ii) until a smooth dispersion of the particles in the solvent results and a monolayer of the adsorbate is adsorbed over the particle surfaces. The quantity of adsorbate in the solution is at least sufficient to enable a mono-layer of it to be adsorbed on the surfaces of the carbon black particles.

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**3,652,462**
**PROCESS FOR PRODUCING SODIUM TUNGSTEN BRONZES**
**Till J. N. Peters, Towanda, and John A. Powers, New Albany, Pa., assignors to Sylvania Electric Products Inc.**
**No Drawing. Filed Oct. 8, 1970, Ser. No. 79,317**
**Int. Cl. H01b *1/06*; C01g *5/00*; C22b *59/00***
**U.S. Cl. 252—518** **14 Claims**

A process for manufacturing sodium tungsten bronzes whereby finely divided pure tungsten oxide, sodium tungstate, and tungsten powder are blended, gassed with an inert gas, and heat treated in an inert gas atmosphere under specific conditions for a predetermined length of time.

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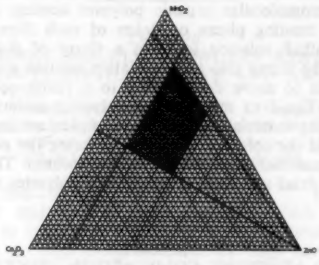
**3,652,463**
**THERMISTOR COMPOSITION**
**John W. Riddel, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.**
**Filed Jan. 26, 1970, Ser. No. 5,852**
**Int. Cl. C09c *1/04*; H01b *1/06***
**U.S. Cl. 252—519** **3 Claims**



A composition for a thermistor wherein the composition comprises approximately ⅓ mole percent zinc oxide, ⅓ mole percent cobaltic oxide, and ⅓ mole percent manganic oxide reacted to form a spinel structure.

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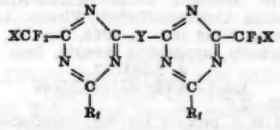
**3,652,464**
**PERFLUOROALKYLENE ETHER AND THIOETHER TRIAZINE POLYMERS**
**George A. Grindahl, Ogden R. Pierce, and John R. Greenwald, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.**
**No Drawing. Original application Oct. 28, 1968, Ser. No. 771,291, now Patent No. 3,566,835, dated Mar. 2, 1971. Divided and this application Nov. 12, 1970, Ser. No. 89,023**
**Int. Cl. C07d *55/50*; C08g *33/02***
**U.S. Cl. 260—2 R** **6 Claims**

The invention provides triazines of the formula



Y being a perfluoroalkylene radical containing at least one ether or thioether linkage, $R_f$ being a monovalent polyfluorinated hydrocarbon radical of no more than 12 carbon atoms, X being bromine or iodine. Triazine polymers of these compounds are also disclosed, as heat-stable elastomers.

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**3,652,465**
**PROCESS FOR PRODUCING POLYMERS OF CYCLIC ACETALS**
**Koichi Takakura, Kurashiki, Japan, assignor to Kuraray Co., Ltd., Kurashiki, Japan**
**No Drawing. Filed June 24, 1970, Ser. No. 49,545**
**Claims priority, application Japan, July 8, 1969, 44/53,987**
**Int. Cl. C08g *11/00***
**U.S. Cl. 260—2 BP** **7 Claims**

Cyclic acetals such as 1,3-dioxolane can be polymerized at high conversion rates to polyethers by using a catalyst system consisting of a zinc halide and a carbon tetrahalide.

3,652,466

## PROCESS OF RECOVERING POLYESTER FROM POLYESTER FILMS HAVING POLYMERIC COATINGS

Erwin Ross Hittel, Brevard, N.C., and Foster Wilson Rennie, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 16, 1968, Ser. No. 745,266
Int. Cl. C08g 53/22
U.S. Cl. 260—2.3 7 Claims

A process for the recovery of polyester base material from films, including photographic films, having at least one macromolecular organic polymer coating comprising (1) treating pieces or flakes of such films with a caustic alkali solution to form a slurry of flakes, (2) feeding the slurry into a classification column and allowing flakes to move downwardly to a rising column of aqueous liquid to separate the polyester material from the coating material, (3) removing flakes settling to the bottom of the column, and (4) recovering the polymeric coating material from the top of the column. The flakes are then dried and used as a source of polyester material.

3,652,467

## MASTIC ADHESIVE COMPOSITION CONTAINING ROSIN POT RESIDUE OR ITS ZINC SALT OR GLYCOL POLYESTER

Albert R. Bunk, Columbus, Bailey Bennett, Worthington, and David A. Berry, Columbus, Ohio, and Bernard A. Parkin, Jr., Walter H. Schuller, and Ray V. Lawrence, Lake City, Fla., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Feb. 27, 1970, Ser. No. 15,229
Int. Cl. C08d 13/38, 9/12
U.S. Cl. 260—2.3 12 Claims

Mastic adhesive compositions having excellent properties for adhesive applications in the building trades industry, which compositions comprise relative proportions by weight of: 100 parts of reclaim rubber; 50 to 200 parts of a rosin pot residue or its zinc salt or glycol polyester; and a hydrocarbon vehicle for the rubber.

3,652,468

## REINFORCED RUBBER COMPOSITIONS

Johann Schwab and Robert Grill, Vienna, Austria, assignors to Semperit Oesterreichisch-Amerikanische Gummiwerke Aktiengesellschaft, Vienna, Austria

No Drawing. Filed June 3, 1968, Ser. No. 733,796
Claims priority, application Austria, June 6, 1967, A 5,261/67
Int. Cl. C08g 41/04, 22/44
U.S. Cl. 260—2.5 8 Claims

Disclosed is a process for the manufacture of vulcanized reinforced rubber compositions having superior mechanical properties and good processability. The process comprises steps of incorporating into a raw rubber composition, prior to its vulcanization, an active hydrogen containing compound which will polymerize to form a polyurethane, and then vulcanizing and polymerizing the resulting mixture to form a polyurethane lattice reinforced rubber composition.

3,652,469

## POLYMERIC FAT ACID POLYAMIDE RESIN INK BINDER

David W. Glaser and Paul D. Whyzmuzis, St. Paul, Minn., assignors to General Mills, Inc.

No Drawing. Filed Dec. 2, 1969, Ser. No. 881,571
Int. Cl. C09d 11/06; C08g 20/26
U.S. Cl. 260—18 N 13 Claims

Polymeric fat acid polyamide resins obtained by reacting an acid mixture comprising a polymeric fat acid and a low aliphatic monocarboxylic acid with an amine mixture comprising an alkylene diamine and a polyhexamethylene polyamine, such as bis(hexamethylene) triamine. The resins are particularly useful in flexographic ink where the resins perform as a binder for the ink, the resins generally being used in the form of alcohol solutions thereof.

3,652,470

## HEAT-CURABLE COMPOSITIONS COMPRISING PARTIALLY CRYSTALLINE UNSATURATED POLYESTER

Rolf Zimmermann and Wolfram Busch, Wiesbaden-Biebrich, and Josef Schmitz, Laubenheim (Rhine), Germany, assignors to Chemische Werke Albert, Wiesbaden-Biebrich, Germany

No Drawing. Continuation-in-part of application Ser. No. 441,897, Mar. 22, 1965. This application July 14, 1969, Ser. No. 841,566
Claims priority, application Germany, Apr. 4, 1964, C 32,568
Int. Cl. C08f 21/04
U.S. Cl. 260—22 CB 11 Claims

A heat curable partially crystalline unsaturated polyester having an acid value below 50, the acid component derived from 40–80 mol percent maleic units that are 50–85% converted to fumaric units in the esterification reaction and 60 to 20 mol percent of a dicarboxylic acid selected from the group consisting of (A) terephthalic units and (B) a combination of at least 4 mols of terephthalic units with 1 mol of at least one other dicarboxylic acid containing 3 to 10 carbon atoms and having no polymerisable olefinic bond, the content of terephthalic units being always at least 20 mol percent, and the alcohol component of the polyester derived substantially from dihydric alcohols, at least 30 mol percent of which have two hydroxy groups of equal reactivity and also a symmetrical molecule.

3,652,471

## POLYESTER AMIDE-IMIDE WIRE ENAMELS

Frank A. Sattler, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

No Drawing. Filed July 28, 1969, Ser. No. 845,482
The portion of the term of the patent subsequent to Jan. 12, 1988, has been disclaimed
Int. Cl. C09d 3/66, 3/72
U.S. Cl. 260—22 R 8 Claims

Economical wire enamels are made by cold blending a polyester-amide-imide of high amide-imide content with polyester of modest cost. Preferably, the composition also comprises an ester-urethane isocyanate as compatibilizing agent.

There are thus obtained wire-enamel formulations of low or modest cost that outperform the oil-modified acrylics in thermal life and the plain enamels (oleoresinous or synthetic oil-modified polyester) in several other properties.

3,652,472

## STABLE DISPERSIONS OF CROSS-LINKED ADDITION POLYMER AND PROCESS OF PREPARING SAID DISPERSIONS

Michael Raymond Clarke, Frankston, Victoria, and Leon Filipowicz, East St. Kilda, Victoria, Australia, assignors to Balm Paints Limited, Melbourne, Victoria, Australia

No Drawing. Filed Oct. 15, 1968, Ser. No. 767,802
Claims priority, application Australia, Oct. 27, 1967, 29,088/67
Int. Cl. C08f 47/18; C09d 5/02
U.S. Cl. 260—22 CB 14 Claims

A process of preparing stable dispersions of cross-linked addition polymer in an organic liquid by first preparing a dispersion of a suitably chemically reactive addition polymer and then cross-linking it with a cross-linking agent

which is at least difunctional with respect to the cross-linking reaction. In one embodiment the cross-linked polymer is further cross-linkable by an autoxidative or free radical initiated cross-linking reaction or both.

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3,652,473

## MODIFIED POLYOLEFIN COMPOSITIONS

Thomas M. Quinn, West Chester, Pa., and James G. Villanueva, New Castle, Del., assignors to Standard Oil Company, Chicago, Ill.

No Drawing. Filed Mar. 12, 1970, Ser. No. 19,101
Int. Cl. C08f *29/02, 37/00;* C09k *3/16*
U.S. Cl. 260—23 12 Claims

Modified polyolefin compositions capable of being fabricated into articles having reduced coefficients of friction, anti-static properties and resistance to "dusting" are provided from a composition comprising a film-forming polyolefin and from about 0.1% to about 4% by weight of (a) the reaction product of a glycerol monostearate-propylene glycol, (b) a phosphoglyceride and (c) a fatty acid ester of a polyglycerol. The modified polyolefin compositions are useful in preparing self-supporting thin gauge films capable of being used in high speed packaging equipment.

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3,652,474

## HOT-MELT ADHESIVE COMPOSITION CONTAINING ROSIN POLYESTER

David A. Berry and Albert R. Bunk, Columbus, Ohio, and Noah J. Halbrook, Walter H. Schuller, and Ray V. Lawrence, Lake City, Fla., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Feb. 27, 1970, Ser. No. 15,236
Int. Cl. C09j *3/26*
U.S. Cl. 260—27 EV 4 Claims

Hot-melt adhesive composition consisting essentially, in relative proportions by weight, of 100 parts of an ethylene-vinyl acetate resin of Ball and Ring softening point between 220° and 280° F. and whose ethylene-vinyl acetate weight percent comonomer ratio is between 85:15 and 65:35; between 40 and 120 parts of a petroleum-derived paraffin or microcrystalline wax; and between 25 and 125 parts of a rosin polyester having an Acid No. below 45 and a Ball and Ring softening point between 50° and 150° F. which rosin polyester is the diethylene glycol ester of $\beta$-propiolactone-modified or acrylic-acid-modified rosin.

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3,652,475

## HEAT-CURABLE ELASTOMERIC SILICONE COMPOSITIONS

Tadashi Wada and Kunio Itoh, Annaka-shi, Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

No Drawing. Filed Apr. 8, 1970, Ser. No. 26,791
Claims priority, application Japan, Apr. 25, 1969, 44/32,147
Int. Cl. C08g *51/22*
U.S. Cl. 260—29.1 B 10 Claims

A heat curable elastomeric silicone composition consisting of:

(a) 100 parts by weight of polydiorganosiloxane having a degree of polymerization of at least 3,000 and containing at most 0.3 mole percent of vinyl group-containing siloxane units;

(b) From 1 to 10 parts by weight of polydiorganosiloxane having a degree of polymerization of at least 3,000, and containing from 5 to 20 mole percent of vinyl group-containing siloxane units;

(c) From 0.5 to 5 parts by weight of polydiorganosiloxane having a degree of polymerization of from 10 to 1,000 and containing from 5 to 90 mole percent vinyl group-containing siloxane units;

(d) From 20 to 200 parts by weight of a silica filler having a surface area of at least 150 $m.^2/g$; and

(e) A catalytic amount of organic peroxide.

The composition is cured to yield a silicone rubber having a high tear strength, or it is employed as a wire-insulating material, sealing material and packing material, because of its excellent compression set, resiliency, heat-, steam-, and weather-resistances and electrical properties.

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3,652,476

## THERMOSET MOLDING POWDERS EMPLOYING GLYCIDYL METHACRYLATE AND AROMATIC AMINES

John F. Fellers, Livonia, Santokh S. Labana, Dearborn Heights, and Seymour Newman, Southfield, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 5, 1970, Ser. No. 43,895
Int. Cl. C08f *45/22*
U.S. Cl. 260—29.1 R 19 Claims

Novel thermosetting resin powders which can be molded to form products characterized, in tensile measurement, by high elongation-to-break, high strength and modulus and by a high glass transition temperature are prepared from a mixture of a prepolymer consisting essentially of glycidyl methacrylate, methyl methacrylate, and methacrylonitrile or acrylonitrile and an amine crosslinking agent.

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3,652,477

## RESOLE VARNISH MIXTURE

George J. Anderson, Wilbraham, and Ronald H. Dahms, Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed July 25, 1968, Ser. No. 747,481
Int. Cl. C08g *37/08*
U.S. Cl. 260—29.3 8 Claims

Phenolic varnishes having dissolved therein two different resole resins. These varnishes are suitable for use in the production of paper laminates having high electrical properties by using only a single pass preparation procedure.

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3,652,478

## COATING COMPOSITION FOR ELECTRODEPOSITION COATING

Masao Ishii, Tokyo, and Takashi Sunamori and Sadao Kimura, Ohtake-shi, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

No Drawing. Filed Oct. 15, 1968, Ser. No. 767,818
Claims priority, application Japan, Oct. 27, 1967, 42/69,146, 42/69,147
Int. Cl. C08f *15/40*
U.S. Cl. 260—29.4 UA 13 Claims

Aqueous solution for coating metal surfaces by electrodeposition wherein main element is a copolymer of an acrylate, another ethylenically unsaturated monomer, a dicarboxylic acid and an alkoxyalkylacrylamide. The behavior of the acid resin in water is defined by $pH=pKa+n \log (\alpha/1-\alpha)$. Excellent one-coat surface gloss is achieved when paK, the acidity of the resin, is at least 8.0, $n$, a parameter based on the extension of the resin in water, is in the range 0.5–1.5, and $\alpha$, the neutralization degree, is 30–80%. The resin is self-cross linking, but durability of the film is enhanced when an epoxy or melamine resin is added. A pigment having an acidity pKp werein the absolute value of the difference pKp—pKa is at least 0.1 may be incorporated in the aqueous solution.

3,652,479

## WATER-SOLUBLE MIXTURES OF AMINO-CONDENSATION POLYMERS AND CATIONIC VINYL ADDITION POLYMERS FOR SLUDGE CONDITIONING

Stanley Mogelnicki, Midland, and Eugene M. Gatza, Bay City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application June 1, 1966, Ser. No. 554,342, now Patent No. 3,409,546. Divided and this application May 29, 1968, Ser. No. 749,234

Int. Cl. C08g 9/00

U.S. Cl. 260—29.4 UA 4 Claims

Compositions containing 1 part by weight of a water-soluble amino-condensation polymer such as a polyalkylene polyamine per 0.02–0.3 part by weight of a water-soluble, cationic vinyl-addition polymer such as those which contain a plurality of aminoalkyl-N-acrylamide units. The polymer mixtures are useful in dewatering sludge and may be applied in the form of an aqueous solution.

3,652,480

## VINYL ESTER COPOLYMERIC EMULSIONS AND PAINTS PREPARED THEREFROM

James Newton Coker, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 23, 1969, Ser. No. 835,798

Int. Cl. C09d 3/74, 5/04

U.S. Cl. 260—29.6 TA 19 Claims

A vinyl ester-based copolymer emulsion is provided which, because of internal modification, is suited for formulation into high-gloss and semigloss paints. The emulsion exhibits interaction with added pigment, thixotropy, body, pH and viscosity stability, as well as mechanical and freeze-thaw stability. The emulsion is readily coalescible under ambient conditions into clear, tough films which cure on drying and develop a high level of water resistance. The essential components of the emulsion are a copolymer of about 75 to 99 percent by weight of vinyl ester, 0 to about 24 percent by weight of softening monomer and about 1 to 3.5 percent by weight of the ammonium salt of an unsaturated carboxylic acid; 0.5 to 7 percent by weight surfactant, preferably 0.5 to 2.5 percent by weight of anionic surfactant and 1 to 4 percent by weight of nonionic surfactant; 0.3 to 3 percent by weight of alkylene imine added in a post-treatment step to iminate the copolymer; and sufficient ammonia banked as the carbonate-bicarbonate to maintain the pH between 7 and 8.4. The presence of about 0.01 to 1 percent by weight of one of a variety of colloidal carboxylated copolymer thickening agents in the emulsion, while not essential, enhances further the desired formulating rheology of the emulsion. Processes for preparing the emulsion and the derived paints are provided.

3,652,481

## STABLE AQUEOUS EMULSIONS OF GRAFT COPOLYMERS

Eugene S. Barabas, Watchung, and Frederick Grosser, Midland Park, N.J., assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed Jan. 29, 1970, Ser. No. 6,956

Int. Cl. C08f 19/00, 41/00

U.S. Cl. 260—29.6 WB 10 Claims

Stable aqueous emulsions comprising a graft copolymer of an alkyl acrylate graft copolymerized on a substrate copolymer of maleic anhydride with an N-vinyl lactam are disclosed. These copolymers are useful as cast films, protective coatings, impregnants, and sizing agents. They are redispersible in water.

3,652,482

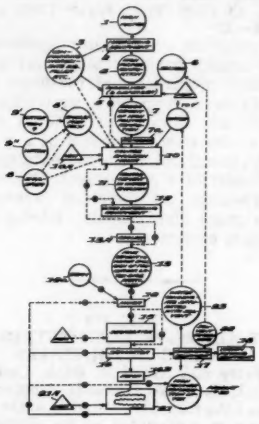
## PROCESSES OF PRODUCING AQUEOUS LATICES OF POLYMER COMPOSITIONS

Oliver W. Burke, Jr., P.O. Box 1266, Fort Lauderdale, Fla. 33061

Continuation-in-part of application Ser. No. 691,823, Dec. 19, 1967, which is a continuation-in-part of application Ser. No. 621,997, Mar. 7, 1967. This application Sept. 10, 1970, Ser. No. 70,949

Int. Cl. C08d 7/00; C09d 5/02

U.S. Cl. 260—29.7 40 Claims



Aqueous latices are prepared from solvent dispersions of polymer compositions by forming a precursor latex particle size emulsion of the solvent dispersion, converting the same to an aerosol or suspension of latex droplets in a solvent vapor stream, providing a flow of latex, and impinging the suspension on the flow of latex to separate the suspended latex droplets from the solvent vapor stream, preferably after subjecting the suspended droplets to partial coalescence. Latices of elastomers and/or plastomers and/or other high polymer compositions having average molecular weights of the order of $10^3$ to $10^6$ can be produced economically while reducing or eliminating foaming and coagulation losses. Certain embodiments employ particular emulsifier combinations, form latices comprising fillers and/or plasticers or softeners, and/or produce latices of mixed polymers. Particular apparatus combination disclosed, and latices produced, are claimed in separate applications filed pursuant to requirements for restriction under 35 U.S.C. 121.

3,652,483

## IMPACT-RESISTANT POLYVINYL CHLORIDE COMPOSITION

Takashi Tanaka and Haruhiko Yusa, Iwaki-shi, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Oct. 1, 1969, Ser. No. 862,931

Claims priority, application Japan, Oct. 4, 1968, 43/72,356

Int. Cl. C08f 29/24, 29/50; C08d 9/08

U.S. Cl. 260—29.7 UP 3 Claims

Impact-resistant polyvinyl chloride resin added to MBS polymer composition consisting of cross-linked MBS graft copolymer and polymethylmethacrylate latex.

3,652,484
## THERMOPLASTIC MOLDING COMPOSITIONS BASED ON SATURATED POLYESTERS

Klaus Weissermel, Kelkheim, Taunus, Rudolf Uebe, Hofheim, Taunus, and Walter Herwig, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

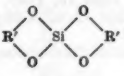
No Drawing. Filed July 2, 1969, Ser. No. 838,667
Claims priority, application Germany, July 2, 1968, P 17 69 713.1
Int. Cl. C08g *51/50*
U.S. Cl. 260—29.15 B 16 Claims

Molding compositions from linear saturated polyesters, inert inorganic solid materials or ionic copolymers, and silicon compounds of Formula I, II or III

(I) $R_mSi(OR_1)_{4-m}$

(in which *m* represents zero or a whole number from 1 to 3)

(II)



(III)

or mixtures of these compounds, which molding compositions may be shaped in the thermoplastic range and from which molded articles are obtained which can easily be removed from the mold.

3,652,485
## AIRCRAFT CARRIER DECK COATING NASL–C–1230

Albert W. Cizek, Jr., Valley Stream, Irving Lerner, Woodside, and Raymond Simeon, Howard Beach, N.Y., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Oct. 13, 1970, Ser. No. 80,489
Int. Cl. C08g *51/36*
U.S. Cl. 260—31.2 2 Claims

A high performance non-slip deck coating for deck areas of ships that has long pot-life, cures readily over a wide temperature range including below 50 degree temperatures and when applied is thicker, tougher, and more resistant to wear and shock than currently used non-slip deck coatings.

3,652,486
## CARVABLE EPOXY RESIN COMPOSITIONS

James Young, East Lansing, Mich., assignor to Ren Plastics, Inc., Lansing, Mich.

No Drawing. Filed Nov. 13, 1968, Ser. No. 775,510
Int. Cl. C08g *51/04, 51/44*
U.S. Cl. 260—32.6 R 18 Claims

Epoxy resin compositions are described which contain micro size, hollow glass spheres and a wax-like, lubricous material and which cure to low-density, dimensionally stable solids having low coefficients of thermal expansion and which are carvable and machinable with unusually low wear on cutting tools. The properties of the cured products make them especially useful in the production of models, prototypes, molds, dies and the like.

3,652,487
## PROCESS FOR THE POLYMERIZATION OF ALICYCLIC MONOMER MASTERBATCHES

John P. Ward, Cuyahoga Falls, and William A. Judy, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Feb. 5, 1970, Ser. No. 9,056
Int. Cl. B01j *11/06*; C08f *45/02, 45/28*
U.S. Cl. 260—33.6 AQ 8 Claims

There is disclosed a process for the polymerization of a monomeric premix comprised of monomer, filler, antioxidant, extending oil and crosslinking agent, by subjecting said monomeric premix under polymerization conditions to a four component catalyst system comprised of an organoaluminum compound, molecular oxygen, a tungsten metal salt and at least one compound of the general formula R—Y—H, wherein Y is selected from the group consisting of oxygen and sulfur and R is selected from a group consisting of hydrogen and hydrocarbon radicals and the products obtained by such a process.

3,652,488
## FLAME RESISTANT SILICONE ELASTOMERS CONTAINING CARBON BLACK AND PLATINUM

James W. Harder, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed July 16, 1969, Ser. No. 842,396
Int. Cl. C08g *51/04*
U.S. Cl. 260—37 SB 16 Claims

A flame resistant silicone elastomer stock having improved flame resistance cures to a flame resistant silicone elastomer. The silicone elastomer stock contains 100 parts by weight of a silicone polymer free of silicon bonded hydrogen atoms, 10 to 100 parts by weight of a reinforcing silica filler, 10 to 150 parts per million by weight based on the weight of the silicone polymer of platinum and 0.05 to 2 parts by weight of carbon black essentially free of sulfur.

3,652,489
## POLYESTER MOULDING COMPOSITIONS

Alan Crowe, St. Fagan, Cardiff, and David P. Fry, Llanishen, Cardiff, Glamorgan, South Wales, assignors to BP Chemicals Limited, London, England

No Drawing. Filed June 9, 1970, Ser. No. 44,887
Claims priority, application Great Britain, June 19, 1969, 31,070/69
Int. Cl. C08g *51/04*
U.S. Cl. 260—40 R 10 Claims

Solid free flowing moulding compositions based on a liquid unsaturated polyester resin system which is adsorbed on a finely divided inorganic primary filler and then blended with a secondary filler or larger average particle size to produce the free flowing particulate product.

3,652,490
## SURFACE COATING COMPOSITIONS AND ARTICLES COATED THEREWITH

Morgan E. Gager, 16 Skyline Drive, South Hadley, Mass. 01075

No Drawing. Filed Apr. 6, 1970, Ser. No. 23,084
Int. Cl. B44d *3/18*; C08g *41/04, 51/04*
U.S. Cl. 260—41 A 2 Claims

Polyurea coated papers or boards or cloths or films or metal sheets serving as substrates or bases or surfaces for artists' paints or color preparations are produced by the application of a polyurea polymer coating composition having free polyisocyanate groups to the substrate and the curing of the so coated substrate.

3,652,491

## BORON-REINFORCED COMPOSITE

Lawrence E. Nielsen, Creve Coeur, and Joseph E. Fields, Ballwin, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Aug. 20, 1968, Ser. No. 753,856
Int. Cl. C08f 45/10
U.S. Cl. 260—41 5 Claims

A shaped composite structure comprising boron fiber as reinforcing filler in a matrix comprising the zinc salt of an acrylic acid polymer, and the method of preparing the same which comprises heating in a mold at a temperature of from about 175° C. to 400° C. and a pressure of from about 5,000 p.s.i. to 50,000 p.s.i. mixture of zinc oxide and an acrylic acid polymer in contact with the boron fiber.

3,652,492

## PROCESS FOR PRODUCTION OF HIGH MOLECULAR SUBSTANCE HAVING OPTICAL SPECIFICITY

Hiroyoshi Kamogawa, Kawasaki-shi, and Masao Kato, Yokohama, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

No Drawing. Filed Feb. 8, 1968, Ser. No. 703,898
Int. Cl. C08f 45/14
U.S. Cl. 260—41 3 Claims

A process for the production of a phototropic high molecular weight polymer comprising reacting thionine with an N-hydroxymethyl group of a polymer of an N-hydroxymethyl(meth)acrylamide in a dehydrative condensation reaction to join said thionine to said polymer.

3,652,493

## POLYESTERS STABILIZED WITH ORGANO SUBSTITUTED SILANES

Mary J. Stewart, Media, Pa., assignor to FMC Corporation, Philadelphia, Pa.

No Drawing. Filed Apr. 14, 1970, Ser. No. 28,530
Int. Cl. C08g 51/58
U.S. Cl. 260—45.7 R 5 Claims

A thermal stabilized polyester composition comprising a highly polymeric polyester containing a stabilizing amount of a compound selected from the group consisting of $HOSi(C_6H_5)_3$, $(C_6H_5)_2Si(OR)_2$, $(C_6H_5)_2(OH)_2$ and $(C_6H_5)_3SiH$ wherein R is a lower alkyl radical.

3,652,494

## STABILIZED FLAMEPROOFED THERMOPLASTIC COMPOSITIONS

Robert M. Baker, Bartlesville, Okla., assignor to Phillips Petroleum Company

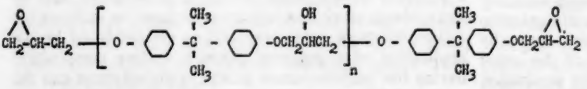
No Drawing. Filed Aug. 16, 1968, Ser. No. 753,077
Int. Cl. C08f 45/58, 51/58
U.S. Cl. 260—45.85 6 Claims

Development of adverse color formation during processing of flameproofed thermoplastic compositions having a halogenated flameproofing agent therein is suppressed by the incorporation into the polyolefin composition of a color suppressing agent selected from the group consisting of

(a) tetrakis [3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionyloxymethyl]methane;

(b) 4,6 - di - (4 - hydroxy-3,5-di-tert-butylphenoxy)-2-octyl thio-1,3,5-triazine;

(c) a polyepoxed resin containing more than one vicinal epoxy group formed by the reaction of bisphenol A (4,4'-isopropylidenediphenol) and epichlorohydrin in the presence of caustic and having the general formula



or mixtures thereof.

3,652,495

## STABILIZATION OF RELATIVELY SATURATED POLYMERS WITH PHENOLIC STABILIZERS AND SULFUR-CONTAINING COMPOUNDS

Paul R. Dean II, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation of application Ser. No. 643,044, June 21, 1967. This application Jan. 13, 1970, Ser. No. 1,986
Int. Cl. C08d 11/04; C08f 45/58
U.S. Cl. 260—45.85 20 Claims

A stabilization system comprising an alkylated phenol and sulfur-containing compounds and polymers, including polystyrene, modified polystyrene, polypropylene and polyethylene polymers, having said stabilization system incorporated therein.

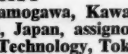
3,652,496

## VIC-DIHYDRAZONOALKANES AS BIOSTATS IN PLASTICS, PAINTS AND TEXTILES

Christian H. Stapfer, Newtown, Pa., assignor to Cincinnati Milacron Chemicals Inc., Reading, Ohio

No Drawing. Filed June 18, 1969, Ser. No. 834,525
Int. Cl. C08f 45/62; C08g 51/60
U.S. Cl. 260—45.9 R 6 Claims

Vic-dihydrazonoalkanes having the formula:



wherein R is hydrogen or alkyl are used as active biostats for the protection of poly(vinyl halide) formulations as well as other plastic compositions, textiles, coating compositions and paint compositions against fungi and bacteria.

3,652,497

## POLYMERIC THICKENERS AND METHOD OF PREPARING SAME

Thomas B. Junas, Arlington, and Augustin La Torre, Burlington, Mass., assignors to General Latex and Chemical Corporation, Cambridge, Mass.

No Drawing. Filed Apr. 20, 1970, Ser. No. 30,285
Int. Cl. C08f 15/36, 19/00
U.S. Cl. 260—47 UA 18 Claims

A polymeric surfactant thickener comprising a copolymer of an ester of an alkylarylpolyether alcohol, such as an alkylphenoxypolyethyleneoxyethanol, with an unsaturated carboxylic acid compound, such as acrylic or methacrylic acid, and an unsaturated acid compound, which copolymer comprises from about 70 to 95% of the ester and from about 5 to 30% of the unsaturated carboxylic acid, and which copolymer contains from about 20 to 100 oxyethylene groups. The polymeric surfactant thickener is particularly useful in thickening polymeric latex compositions, such as carboxylated styrene-butadiene latex containing filler material.

3,652,498

## PROCESS FOR PREPARING POLYAMIDE-IMIDES

Edwin F. Morello, Whiting, Ind., and Carl Serres, Jr., Naperville, Ill., assignors to Standard Oil Company, Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 26,429, Apr. 7, 1970. This application Mar. 1, 1971, Ser. No. 119,875
Int. Cl. C08g 20/32
U.S. Cl. 260—47 CP 12 Claims

An improved process for producing soluble polymers for use as a polyamide-imide wire enamel. In a process where wire enamels are produced from an equimolar reaction of an acid halide of a benzene tricarboxylic acid

anhydride and an aromatic primary diamine in an alkyl substituted phenol or phenol medium, the improvement in said process comprising pretreating the reaction medium with about 1 to 5% water or aliphatic alcohol based on weight prior to the scavenging of the entrained hydrogen halide with an alkylene oxide consisting of about 2 to 4 carbon atoms thus reducing the tendency of the polymer solution to gel and improving the properties of said polymer.

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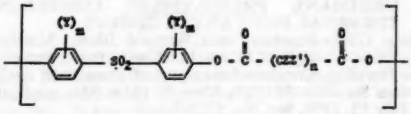
**3,652,499**
**SOLVENT RESISTANT POLYESTERS**
**Willem F. H. Borman, Pittsfield, Mass., assignor to General Electric Company**
**No Drawing. Filed Apr. 29, 1969, Ser. No. 820,338**
**Int. Cl. C08g** *17/06, 17/08*
**U.S. Cl. 260—49** **12 Claims**

This invention is for a novel class of linear polyesters having the repeating structural unit



where Y is an inert substituent on the phenylene nucleus; Z and Z′ are individually selected from the group of hydrogen, lower alkyl and halogen; the letter *m* is any whole number from and including 0 to the number of positions on the phenylene nucleus available for substitution; and the letter *n* is 1, 3 or 5. The polymer preferably has sufficient repeating units to have a molecular weight of at least 10,000. Preferred polymers are derived from 4,4′-sulfonyl diphenol; 4,4′ - sulfonyl-di-(2,6-xylenol); 4,4′-sulfonyl-bis-(2,6-dichloro phenol) or 4,4′-sulfonyl-bis-(2,6-dibromo phenol) and glutaric acid. The polyesters of this invention are similar in structure to polyesters of the prior art, but are distinguishable therefrom by unexpectedly superior solvent resistant properties.

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**3,652,500**
**PROCESS FOR PRODUCING POLYAMIDE COATING MATERIALS BY ENDCAPPING**
**Marvin A. Peterson, Fort Wayne, Ind., assignor to General Electric Company**
**Filed Aug. 21, 1969, Ser. No. 851,835**
**Int. Cl. C08g** *20/32*
**U.S. Cl. 260—65** **12 Claims**

I first prepare a polyamide prepolymer using aromatic dianhydride and aromatic diamine starting materials wherein the reactants are in the molar ratio of 2/1 and thereby produce a stable precursor material. There is added to this stable precursor, which may be represented by the formula XYX, or YXY, wherein X represents aromatic dianhydride and Y represents aromatic diamine, a further amount of X or Y in a predetermined molar excess to effect polymerization of the precursors which are "zipped up" to any desirable molecular weight range and thereafter I slowly add either X or Y (depending upon which reactant was used to zip up the precursor) as a back addition. It is noted that the inherent viscosity which is an indicator of molecular weight climbs sharply, and if the X or Y is slowly added to the precursor, the formulator can closely control the molecular weight of the polyorthoamic acid prepolyimide material.

Applying the described procedure it has been found that aromatic carboxylic dianhydride terminated molecules exhibit certain undesirable properties when the prepolyimide materials produced are used as a coating on magnet wire; and therefore, following the described synthesis procedure, and subsequently to the back-titration, I proceed to endcap the molecules by the addition of Y so that all of the molecules are terminated by Y or its equivalent whereby the untoward effect of X terminated molecules will not manifest undesirable reactions when the material is used in producing coatings for magnet wire.

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**3,652,501**
**WATER SOLUBLE ALKYD RESINS**
**Kenneth H. Albers, Alden E. Blood, and Thomas C. Snapp, Jr., Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.**
**No Drawing. Filed May 28, 1970, Ser. No. 41,577**
**Int. Cl. C08g** *20/30*
**U.S. Cl. 260—75 N** **16 Claims**

This invention relates to a curable, water-soluble alkyd resin useful in an improved protective coating composition. The resin is a polyesteramide of at least one polycarboxylic acid and at least one polyhydroxyalcohol, the alcohol comprising a substantial amount of N,N-bis[2-hydroxyethyl]-2-hydroxyethoxyacetamide and preferably one additional polyhydroxyaliphatic or cycloaliphatic alcohol, e.g. 1,4-cyclohexane dimethanol.

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**3,652,502**
**LINEAR POLYESTERS HAVING FREE CARBOXYL RADICALS DISTRIBUTED ALONG THE MOLECULAR CHAIN, COATINGS THEREOF AND COATED SUBSTRATES**
**Winston J. Jackson, Jr., John R. Caldwell, and Herbert F. Kuhfuss, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.**
**No Drawing. Filed Aug. 5, 1970, Ser. No. 61,441**
**Int. Cl. C08g** *17/04, 17/18, 39/02*
**U.S. Cl. 260—75 R** **14 Claims**

Carboxylated linear polyester having linear chains from polyester forming constituents including a trihydric alcohol (e.g., glycerine) having two primary hydroxyl groups and one secondary hydroxyl group, said secondary hydroxyl group being esterified with a di- or tricarboxyl-containing anhydride constituent (e.g., trimellitic anhydride) to give said carboxylated linear polyester containing from 1–15 weight percent of free carboxyl groups from said esterified anhydride constituent which are pendant from the linear chains. These linear carboxylated polyesters form coatings and promote adhesion of polymeric coating material to substrates such as metal, glass, etc., e.g., coatings for steel, coatings for electrical components, ink compositions having improved adhesion, etc.

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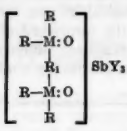
**3,652,503**
**PRODUCTION OF AROMATIC POLYESTERS OF IMPROVED COLOUR**
**Warren Hewertson, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England**
**No Drawing. Filed Nov. 17, 1969, Ser. No. 877,502**
**Claims priority, application Great Britain, Dec. 3, 1968, 57,271/68**
**Int. Cl. C08g** *17/015*
**U.S. Cl. 260—75 R** **16 Claims**

In the production of highly polymeric polyesters of aromatic dicarboxylic acids and ethylene glycols by the polycondensation of polycondensable material at least 85 mole percent of which consists of at least one bis ethylene glycol ester of an aromatic dicarboxylic acid especially bis ethylene glycol terephthalates the use of a co-ordination compound of a trivalent antimony compound and an organic oxo compound of phosphorus or arsenic as polycondensation catalyst leads to products having a reduced tendency to a grey discolouration compared with those prepared

using conventional antimonial catalysts. The preferred catalysts are coordination compound having the structure



where each M is phosphorus or arsenic, each R is hydrocarbyl or hydrocarbyloxy, $R_1$ is a direct link or a divalent hydrocarbon group, especially $—CH_2—$ or $—CH_2CH_2—$, and Y is an anion, especially halide.

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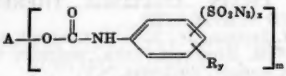
3,652,504

## RADIATION SENSITIVE POLYURETHANE

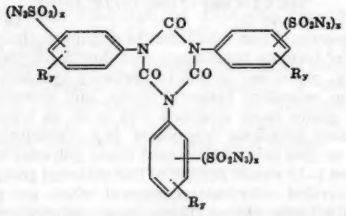
Adnan A. R. Sayigh and Fred A. Stuber, North Haven, and Henri Ulrich, Northford, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Mar. 2, 1970, Ser. No. 15,948
Int. Cl. C08q *22/04*
U.S. Cl. 260—77.5 A 4 Claims

Polyurethane coatings are chemically bonded to substrates including polyolefins and like substrates with which polyurethanes will not normally react, by incorporating, into the polyurethane coating composition used to prepare the coating, from 0.1 percent to 10 percent by weight, based on polyurethane, of a sulfonylazide of formulae:



and



wherein A is the residue of an aliphatic alcohol having *m* hydroxyl groups and a molecular weight less than 300, R is lower-alkoxy or halo, *x* is 1 to 2, *y* is 0 to 2 and *x*+*y* is ≯3, the $SO_2N_3$ groups are in 3, 4, or 5-positions in the phenyl rings provided that one such position is always unsubstituted and *m* is 1 to 6. The chemical bonding can be carried out by irradiation imagewise thereby making the compositions useful in photoresist systems.

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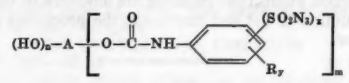
3,652,505

## RADIATION SENSITIVE POLYURETHANES

Adnan A. R. Sayigh and Fred A. Stuber, North Haven, and Henri Ulrich, Northford, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Mar. 2, 1970, Ser. No. 15,949
Int. Cl. C08g *22/04, 22/16*
U.S. Cl. 260—77.5 AQ 4 Claims

Radiation (both heat and light)-sensitive polyurethanes are provided and are useful in the preparation of coatings which can be chemically bonded, by exposure to an appropriate source of radiation, to substrates containing C—H bonds (preferred substrates are polyolefins). The exposure can be carried out selectively in accordance with photoresist system technology or can be carried out over complete surfaces so as to bond paint and like sealant coatings to substrates such as exterior building surfaces and the like. The radiation-sensitive polyurethanes are derived by replacing part or the whole of the active hydrogen containing component, conventionally employed to form polyurethanes (by reaction with polyisocyanates), by a polyol of the formula:



where A=residue of an aliphatic alcohol of valency $(m+n)$ and M.W. <300, *n* is 2 to 5, *m* is 1 to 4 and $m+n$ is ≯6, R is lower-alkyl or halogen, $x=1$ to 2, $y=0$ to 2 and $x+y$ is ≯3, and $SO_2N_3$ is in the 3, 4, or 5-position in the phenyl nucleus, one of said positions being unsubstituted.

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3,652,506

## PROCESS FOR THE PREPARATION OF POLYURETHANE PREPOLYMERS COMPRISING TERMINAL ISOCYANATE GROUPS

Alain Gibier-Rambaud and Bernard Blanc, Martigues, France, assignors to Naphtachimie, Paris, France

No Drawing. Continuation-in-part of abandoned application Ser. No. 804,703, Mar. 5, 1969. This application July 22, 1970, Ser. No. 57,295
Claims priority, application France, July 25, 1969, 6925422
Int. Cl. C08g *22/34*
U.S. Cl. 260—77.5 AB 8 Claims

Preparation of polyurethane prepolymers having terminal isocyanate groups comprising reacting an organic polyisocyanate with a polyhydroxylated compound having less than 0.1 percent by weight of water in the presence of a hydrolyzable metal halide at a temperature within the range of 50° to 100° C.

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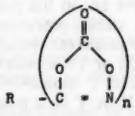
3,652,507

## CATALYTIC CONDENSATION OF CYCLIC NITRILE CARBONATES

Emmett H. Burk, Jr., Glenwood, Ill., Helmuth W. Kutta, Buffalo, N.Y., and Larry G. Wolgemuth, Hickory Hills, Ill., assignors to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed Dec. 3, 1968, Ser. No. 780,878
The portion of the term of the patent subsequent to Sept. 29, 1987, has been disclaimed
Int. Cl. C08g *22/00, 22/04, 22/34*
U.S. Cl. 260—77.5 AB 33 Claims

An improved method of preparing an organic compound having one or more urea, urethane or thiourethane groups by condensing nucleophilic compounds having one or more primary amino, secondary amino, hydroxyl or mercapto radicals with cyclic nitrile carbonates of the formula:



wherein R is an organic radical which is free of reactive hydrogen atoms and *n* is 1 to 4. The method involves catalyzing the condensation reaction with the catalyst combination of:

(I) a first metal selected from the metals of Groups III through V of the Periodic Chart, e.g., tin, and

(II) a second metal selected from the metals of Groups I and II and the iron series of Group VIII of the Periodic Chart, e.g., and alkali metal. Thus, for example, polyurethanes with weight average molecular weights of from about 150,000, or even about 300,000, to 1 million or more can be prepared by

condensing a poly(tetramethylene ether) glycol with butane-1,4-di(nitrile carbonate) using a catalyst combination of tin (supplied as dibutyl tin dilaurate) and sodium (supplied as sodium t-butoxide).

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3,652,508

## VISCOSITY STABLE ALIPHATIC POLYURETHANE COMPOSITIONS AND METHOD OF PREPARATION THEREOF

Donald L. Segur, Andover, and Harold E. Garey, Jr., Ipswich, Mass., assignors to General Latex and Chemical Corporation, Cambridge, Mass.

No Drawing. Filed Apr. 7, 1969, Ser. No. 814,159
Int. Cl. C08g 22/04, 22/08
U.S. Cl. 260—77.5 AA 24 Claims

Viscosity-stable aliphatic polyurethane resin compositions are prepared by reacting an alkylene oxide with moisture present in the organic polyfunctional compound prior to the reaction of the compound, such as a polyol, with the aliphatic polyisocyanate compounds to prepare the aliphatic polyurethane resin.

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3,652,509

## COPOLYAMIDES OF PARAXYLYLENE DIAMINE

Yoshizo Tsuda, Akinori Yamamoto, and Masamitsu Tanimura, Otsu-shi, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

No Drawing. Filed Nov. 18, 1969, Ser. No. 877,851
Claims priority, application Japan, Nov. 27, 1968, 43/86,397
Int. Cl. C08g 20/20
U.S. Cl. 260—78 R 26 Claims

The present invention relates to a polyamide, and a fiber thereof, consisting of a novel paraxylylene copolyamide. More particularly, the invention relates to a polyamide fiber consisting of a copolyamide of paraxylylene diamine with two $\alpha$-$\omega$ dicarboxylic alkanes each having 6–13 carbon atoms and differing from one another in that one of said acids has 1–2 carbon atoms more than the other.

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3,652,510

## POLY(1,4-BENZAMIDE) PARTICLES AND THE PREPARATION THEREOF

Richard N. Blomberg, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation of abandoned application Ser. No. 747,126, July 24, 1968. This application Mar. 17, 1971, Ser. No. 125,354
Int. Cl. C08g 20/04
U.S. Cl. 260—78 A 9 Claims

Shaped acicular particles of poly(1,4-benzamide) of specified characteristics are precipitated from a composition comprising the polymer, an amide or urea medium and lithium chloride, using specified non-solvents. Articles of manufacture including textile denier fibers, that are comprised of these particles exhibit excellent tensile properties.

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3,652,511

## WATER-DISPERSIBLE POLYIMIDE COATINGS

Gerald G. Vincent, Barrington, and Thomas E. Anderson, Palatine, Ill., assignors to De Soto, Inc., Des Plaines, Ill.

No Drawing. Filed Apr. 28, 1969, Ser. No. 820,017
Int. Cl. C08g 20/20
U.S. Cl. 260—78 UA 10 Claims

Water dispersible polyimide coatings are formed by reacting an unsaturated anhydride such as maleic anhydried with a diprimary amine such as polyoxypropylene diamine, and the bis-imide so provided is then reacted with further diprimary amine to produce a resinous polyimide polymer having secondary amino-hydrogen atoms which enable reaction with a polycarboxylic acid monoanhydride, such as maleic anhydride, to produce an acidic derivative which can be dispersed in water with the aid of a base. The water-dispersed resin can be electrodeposited at the anode with a unidirectional electrical current. If desired, a sulfhydryl-terminated low molecular weight elastomer may be incorporated into the polyimide utilizing the unsaturation of the polymer for this purpose.

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3,652,512

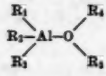
## POLYMERS OF 3-METHYL-1,3-PENTADIENE

James Neil Henderson, Hudson, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation of application Ser. No. 836,200, June 11, 1969, which is a continuation of application Ser. No. 554,655, June 2, 1966. This application June 16, 1970, Ser. No. 48,909
Int. Cl. C08d 3/08, 1/14
U.S. Cl. 260—79.5 B 7 Claims

A polymer of 3-methyl-1,3-pentadiene having a high cis-1,4 content prepared by subjecting 3-methyl-1,3-pentadiene to polymerization in the presence of a catalyst formed from (1) at least one metal halide selected from the group consisting of titanium tetrachloride and vanadium trichloride, and (2) at least one compound selected from the group consisting of (A) an organoaluminum compound of the formula

and (B) organo etherates of compounds having the formula:



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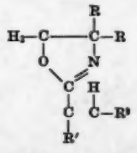
3,652,513

## POLYMERS OF FLUOROOXAZOLINES AND THEIR PREPARATION

Domenick Donald Gagliardi, East Greenwich, R.I., assignor to Commercial Solvents Corporation, New York, N.Y.

No Drawing. Original application Dec. 12, 1966, Ser. No. 600,713. Divided and this application Feb. 12, 1969, Ser. No. 871,151
Int. Cl. C08f 7/12
U.S. Cl. 260—80.3 15 Claims

Polymers of compositions having the formula



wherein R is a radical selected from the group consisting of —$CH_2OH$, lower alkyl having 1 up to about 3 carbon atoms and —$CH_2OOCR^2$; $R^2$ is a radical selected from the group consisting of alkyl having 1 up to about 22 carbon atoms and fluoroalkyl having 1 up to about 22 carbon atoms; R′ is a radical selected from the group consisting of alkyl having 1 up to about 21 carbon atoms and fluoroalkyl having 1 up to about 21 carbon atoms wherein not less than 75% of the hydrogen atoms have been replaced by fluorine atoms and wherein at least 2 of the hydrogen atoms on at least one terminal carbon have been replaced by fluorine atoms with the provision that when R′ is an alkyl radical at least one of the substituents designated R is the radical —$CH_2OOCR^2$ and the substituent $R^2$ is a fluoroalkyl radical having 1 up to about 22 carbon atoms wherein not less than 75% of the hydrogen atoms have been replaced by fluorine atoms and wherein at least 2 of

the hydrogen atoms on at least one of the terminal carbon atoms have been replaced by fluorine atoms; and $R^9$ is a radical selected from the group consisting of hydrogen, lower alkyl, and aryl, are provided as well as methods for their preparation.

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3,652,514

## CURABLE, AMORPHOUS, OLEFINIC TERPOLYMERS FROM ALPHAMONO OLEFINS AND POLYENES

Sebastiano Cesca, Sergio Arrighetti, and Walter Marconi, Donato Milanese, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

No Drawing. Filed Sept. 5, 1969, Ser. No. 855,771
Claims priority, application Italy, Sept. 5, 1968, 843,706/68
Int. Cl. C08f *15/40*
U.S. Cl. 260—80.78 10 Claims

A curable amorphous olefinic terpolymer of two different alpha-olefins having up to 10 carbon atoms and a polycyclic polyene, such as 4,7 endomethylene-4,7-dihydroindene, which contains an endomethylene group ortho-condensed with a hydrocarbon ring, the two carbon atoms common to two rings being part of a conjugated diene system the double bonds of which are in the ring other than that containing the endomethylene group, is disclosed.

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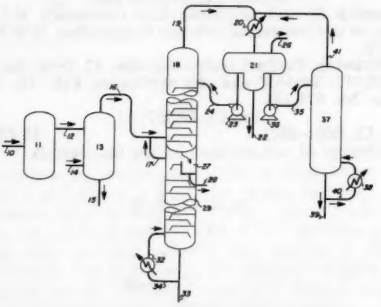
3,652,515

## NOVEL PROCESS WHEREIN MONOMERS AND DILUENT SOLVENT ARE RECOVERED FROM FLASHED EFFLUENT FROM THE POLYMERIZATION OF ETHYLENE, A $C_3$–$C_{10}$ HIGHER ALPHA OLEFIN, AND OPTIONALLY A THIRD MONOMER

James H. Love, Somerville, N.J., assignor to Esso Research and Engineering Company

Filed Dec. 8, 1969, Ser. No. 883,042
Int. Cl. C08f *15/40, 15/04*
U.S. Cl. 260—80.78 12 Claims



Monomers and diluent-solvent are recovered from flashed effluent from the polymerization of ethylene, a $C_3$ to $C_{10}$ higher alpha olefin, and optionally third monomer.

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3,652,516

## POLYMERIZATION OF CONJUGATED DIENES OR MONOVINYL AROMATIC MONOMERS WITH MULTIFUNCTIONAL INITIATORS FROM DIISOPROPENYLBENZENE

Ralph C. Farrar, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Feb. 10, 1969, Ser. No. 798,128
Int. Cl. C08f *7/04, 15/04*; C08d *1/32*
U.S. Cl. 260—83.7 7 Claims

Hydrocarbon soluble multifunctional polymerization initiators are produced by reacting diisopropenylbenzene compounds with organomonolithium compounds.

3,652,517

## VULCANIZABLE POLYMERS AND PROCESS FOR PRODUCING THEM

Toshio Yoshimoto, Seiya Kaneko, Takashi Sasaki, Tsuneaki Narumiya, Hiroshi Yoshii, and Tetsuya Takamatsu, Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

No Drawing. Filed Feb. 5, 1970, Ser. No. 9,071
Claims priority, application Japan, Feb. 8, 1969, 44/9,010
Int. Cl. C08d *5/00, 5/04*
U.S. Cl. 260—85.1 17 Claims

Halogenated and hydrogenated polymers which are vulcanizable and which are produced by hydrogenating a polymer dissolved in an inert solvent in the presence of a Ziegler-type hydrogenation catalyst, halogenating the resulting hydrogenated polymer by contacting halogen therewith, mixing water or a non-solvent with said hydrogenated polymer solution, removing the catalyst with water or the non-solvent, and recovering the halogenated hydrogenated polymer free from the catalyst.

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3,652,518

## PROCESS FOR PREPARING ALTERNATING COPOLYMERS OF BUTADIENE AND α-OLEFINE AND HIGH MOLECULAR WEIGHT ALTERNATING COPOLYMERS

Akihiro Kawasaki, Ichihara-shi, Hiroaki Ueda, Chiba-shi, and Isao Maruyama, Ichihara-shi, Japan, assignors to Maruzen Petrochemical Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1969, Ser. No. 884,871
Claims priority, application Japan, Dec. 26, 1968, 43/94,939; Mar. 22, 1969, 44/21,423; Apr. 15, 1969, 44/28,632
Int. Cl. C08d *1/14, 3/02*
U.S. Cl. 260—85.3 9 Claims

A process for preparing an alternating copolymer of butadiene and α-olefine is disclosed. Said process comprises contacting butadiene and α-olefine in liquid phase with a catalyst system comprising the first component of an organoaluminum compound having the general formula $AlR_3$ (R represents a hydrocarbon radical), the second component being a vanadium compound having no vanadium-halogen linkage and the third component being chlorine, bromine, iodine, a compound thereof or a mixture of them. The copolymerization conditions such as temperature, initial monomer composition, diluent etc. are also disclosed. Physical properties of a novel high molecular weight alternating copolymer of butadiene and an α-olefine having the formula $CH_2$=CHR, wherein R represents a $C_1$–$C_4$ normal or branched chain alkyl radical are also disclosed.

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3,652,519

## ALTERNATING COPOLYMERS OF BUTADIENE AND α-OLEFINE AND A PROCESS FOR THEIR PREPARATION

Akihiro Kawasaki, Ichihara-shi, Hiroaki Ueda, Chiba-shi, and Isao Maruyama, Ichihara-shi, Japan, assignors to Maruzen Petrochemical Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1969, Ser. No. 884,479
Claims priority, application Japan, Dec. 21, 1968, 43/93,503, 43/93,504
Int. Cl. C08d *3/02*
U.S. Cl. 260—85.3 10 Claims

Alternating copolymers of butadiene and α-olefine of the formula $CH_2$=CHR wherein R is $C_1$–$C_4$ alkyl or phenyl are formed by reaction in the presence of a catalyst comprising an organoaluminum compound and certain vanadium chlorides or oxychlorides. When styrene is used, the copolymer has an intrinsic viscosity greater than 0.1 dl./g. in chloroform at 30° C.; otherwise the co-

polymers have an intrinsic viscosity not greater than 0.1 dl./g., measured similarly.

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3,652,520

## POLYMERS OF POLYMERIZABLE POLYDIENE ETHYLENICALLY UNSATURATED ESTERS

**Patrick W. Ryan, Chicago Heights, and Ronald E. Thompson, Park Forest, Ill., assignors to Atlantic Richfield Company, New York, N.Y.**

**No Drawing. Filed Mar. 22, 1968, Ser. No. 715,155**

**Int. Cl. C08f** *3/62, 15/18*
**U.S. Cl. 260—86.1** **14 Claims**

Polymerizable polydiene ethylenically-unsaturated esters having at least about one terminal, ethylenically-unsaturated acyloxy group are obtained by esterifying certain intermediate polyhydroxy polymers with an acyl compound, reactive with hydroxyl to form an ester, and having its acyl group ethylenically-unsaturated, such as acrylic, crotonic or methacrylic acid. The usually liquid intermediate polyhydroxy polymer has an average of at least about 1.8 predominantly primary, terminal, allylic hydroxyl groups per molecule and is an addition polymer containing 0 to about 75% by weight of the residue of an alpha-monoolefin, such as styrene, and 25 to 100% of the residue of a 1,3-diene, such as butadiene, the intermediate polyhydroxy polymer having a viscosity at 30° C. of about 5–20,000 poises, having the majority of its unsaturation in the main carbon chain, and a number average molecular weight of about 400 to 25,000. These usually liquid polydiene ethylenically-unsaturated esters contain terminal, allylic, ethylenically unsaturated acyloxy or ester groups and are capable of further polymerization through these unsaturated end groups to produce homopolymers and copolymers with polymerizable vinyl monomers, such as styrene, ranging in properties from soft rubbers to high impact plastics. These ethylenically-unsaturated esters can be used as modifiers in various plastic and other poly-ester compositions to improve flexibility, electrical properties and hydrolytic stability.

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3,652,521

## LATENTLY REACTIVE COMPOSITION REACTABLE UNDER INFLUENCE OF MOISTURE AND ITS METHOD OF PREPARATION AND USE

**Thomas Abend, Rapperswil, Switzerland, assignor to Gurit AG, Richterswil, Switzerland**

**No Drawing. Filed Aug. 29, 1969, Ser. No. 854,282**

**Claims priority, application Switzerland, Sept. 4, 1968, 13,265/68**

**Int. Cl. C08f** *3/64, 15/18*
**U.S. Cl. 260—86.1** **16 Claims**

A composition of matter containing a monomer wherein the monomer may be caused to form a polymer at some time in the future without the necessity of adding any additional ingredients to the composition. Polymerization is caused by exposing the composition to moisture. Essentially, the presence of the moisture results in a free-radical reaction wherein certain radicals cause the monomer to undergo a polymerization reaction. The novel composition of this invention comprises (1) at least one liquid material polymerizable under the action of radicals, (2) at least one initiator system causing the formation of radicals under the influence of surrounding moisture, and (3) a drying agent. Certain optional ingredients such as fillers, surface active agents and the like may also be added.

3,652,522

## PROCESS FOR THE POLYMERIZATION OF VINYL CHLORIDE

**Sergio Lo Monaco and Corrado Mazzolini, Mestre, Luigi Patron, Sestriere, and Alberto Moretti, Venezia, Italy, assignors to Chatillon Societa Anonima Italiana per le Fibre Tessili Artificiali S.p.A., Milan, Italy**

**No Drawing. Filed Dec. 16, 1968, Ser. No. 784,191**

**Claims priority, application Italy, Dec. 19, 1967, 24,081/67**

**Int. Cl. C08f** *1/62, 1/04, 3/30*
**U.S. Cl. 260—87.5 R** **16 Claims**

A low-temperature bulk polymerization process for vinyl chloride is disclosed wherein the polymerization is carried out in the presence of a combined catalyst system consisting of an organic hydroperoxide and a salt of a monoester of sulphurous acid.

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3,652,523

## 3,3-DIMETHYL-4,5-EPOXYPENTENE-1 AND POLYETHERS THEREOF

**Thomas N. Baker III, Philadelphia, and Giovanni A. Bonetti, Wynnewood, Pa., assignors to Atlantic Richfield Company, New York, N.Y.**

**No Drawing. Filed Mar. 24, 1970, Ser. No. 22,379**

**Int. Cl. C08f** *7/12*
**U.S. Cl. 260—88.3** **3 Claims**

The novel monomer, 3,3-dimethyl-4,5-epoxypentene-1, and the polyethers prepared therefrom. The polyethers are characterized by having an unsaturated side chain which is amenable to curing, graft polymerization and in particular the production of stable halogenated fire resistant polymers.

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3,652,524

## PROCESS FOR POLYMERIZING VINYL CHLORIDE WITH LOW MOLECULAR WEIGHT ACYL PEROXYCARBONIC ESTERS

**Roger N. Lewis, Pinole, and Ronald L. Friedman, San Rafael, Calif., assignors to Argus Chemical Corp., Brooklyn, N.Y.**

**No Drawing. Original application Dec. 26, 1967, Ser. No. 693,187, now Patent No. 3,585,232, dated June 15, 1971. Divided and this application May 4, 1970, Ser. No. 46,587**

**Int. Cl. C08f** *3/30, 1/11, 1/74*
**U.S. Cl. 260—92.8 W** **7 Claims**

Low molecular weight (4–7 carbon atoms) acyl peroxycarbonic aliphatic esters.

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3,652,525

## METHOD FOR PRODUCING POLYVINYL-CHLORIDE PARTICLES

**Akihide Nakamura, Iko Ito, and Mutuo Goto, Niihamashi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan**

**No Drawing. Filed June 17, 1968, Ser. No. 737,292**

**Int. Cl. C08f** *1/13, 3/30, 47/20*
**U.S. Cl. 260—92.8 W** **5 Claims**

Vinyl chloride polymer having a composite structure in which the average polymerization degree of molecules constituting unit particles lowers from their respective central portions towards the circumferential portions is

obtained by elevating the polymerization temperature or by adding a chain transfer agent to the polymerization system in the course of emulsion polymerization of vinyl chloride. Plastisol prepared from the vinyl chloride resin obtained by subjecting the polymer latex to spray drying has lower gelation temperature than that of a plastisol prepared from vinyl chloride polymer obtained according to usual processes, and is very useful for various uses such as coating, dipping and slush molding.

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3,652,526

## POLYMERIZATION PROCESS FOR VINYLIDENE MONOMERS

**Robert L. Bourget, North Wilbraham, and Nandlal S. Reejhsinghani, Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.**

**No Drawing. Filed Dec. 24, 1969, Ser. No. 888,086**

**Int. Cl. C08f** *1/11, 3/30*

**U.S. Cl. 260—92.8 W** **14 Claims**

Vinylidene monomers are polymerized in a relatively short polymerization cycle utilizing a fast polymerization initiator and a substantially constant polymerization rate over a substantial portion thereof. Early in the cycle, the hourly rate of conversion is brought to about 26.0 to 35.0 percent and, to the point of termination of the reaction, it is maintained at a level not exceeding about 35.0 percent. The conversion rate is maintained substantially constant within the range specified until at least about 60.0 percent of the monomer is converted to polymer, and this is accomplished by controlling heat removal from the reaction and by incrementally adding initiator and water. The process has proven particularly advantageous for polymerizing vinyl chloride monomer formulations with acetyl sulfonyl peroxide initiators.

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3,652,527

## POLYMERIZATION OF PROPYLENE WITH ZIEGLER CATALYSTS IN A STIRRED GAS PHASE REACTOR

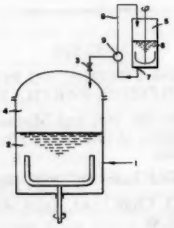
**Hans-Georg Trieschmann, Hambach, Wolfgang Rau, Heidelberg, and Theodor Jacobsen and Helmut Pfannmueller, Limburgerhof, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany**

**Filed Oct. 27, 1969, Ser. No. 869,577**

**Claims priority, application Germany, Oct. 29, 1968, P 18 05 765.3**

**Int. Cl. C08f** *1/42, 3/08*

**U.S. Cl. 260—93.7** **7 Claims**



A process for the polymerization of propylene in the gas phase in a bed of powdered polypropylene by means of a catalyst system of: (a) a solution of an aluminum alkyl in a hydrocarbon; and (b) a suspension of a titanium or vanadium halide compound in a hydrocarbon; in which the two components (a) and (b) are supplied separately to the reaction zone.

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3,652,528

## PROCESS FOR THE POLYMERIZATION OF ISOPRENE IN HOMOGENEOUS PHASE

**Augusto Bonfardeci, Milan, Italy, assignor to Montecatini Edison S.p.A., Milan, Italy**

**No Drawing. Filed Feb. 11, 1970, Ser. No. 10,622**

**Claims priority, application Italy, Feb. 11, 1969, 12,702/69**

**Int. Cl. C08d** *1/12, 3/02, 3/10*

**U.S. Cl. 260—94.3** **6 Claims**

There is disclosed a process for polymerizing isoprene, in homogeneous phase, to high polymers in which the proportion of isoprene units having cis-1,4 enchainment is practically identical with that of natural rubber. The process utilizes a ternary catalyst system prepared by mixing $TiCl_4$, an organometallic compound of the type $AlR_2Cl$ in which R is an alkyl group, and an unsaturated polymer, preferably a polybutadiene or polyisoprene having at least prevailingly cis-1,4 structure and a molecular weight such that the catalyst is soluble in the polymerization mixture and preferably corresponding to an intrinsic viscosity of from 0.4 to 0.8 dl./g., determined in toluene at 30° C.

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3,652,529

## METHOD FOR PRODUCING SOLID POLYBUTADIENE CONTAINING MORE THAN 60 PERCENT 1,2-MICROSTRUCTURE

**William A. Judy and Morford C. Throckmorton, Akron Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**No Drawing. Filed Apr. 23, 1970, Ser. No. 31,354**

**Int. Cl. C08d** *1/14, 3/06*

**U.S. Cl. 260—94.3** **4 Claims**

A method is disclosed to produce a polybutadiene containing more than 60 percent of the polymer in a 1,2 microstructure which comprises polymerizing butadiene under solution polymerization conditions, with a catalyst comprising (1) an organoaluminum compound, (2) tungsten oxychloride and (3) a nickel salt of a carboxylic acid or an organo complex compound of nickel in which the mole ratio of aluminum to tungsten is equal to or greater than 1.5/1.

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3,652,530

## ANTIHEMOPHILIC FACTOR PREPARED FROM BLOOD PLASMA USING POLYETHYLENE GLYCOL

**Alan J. Johnson, New York, Jack Newman, Pelham, and Margaret Howell Karpatkin, New York, N.Y., assignors to American National Red Cross, Washington, D.C.**

**No Drawing. Filed Aug. 28, 1967, Ser. No. 663,507**

**Int. Cl. A23j** *1/06;* **C08h** *1/00*

**U.S. Cl. 260—112 B** **11 Claims**

Antihemophilic factor is separated as a precipitate from fresh-frozen human plasma with a low concentration of ethanol, preferably 3 percent, at low temperature, followed by extraction with a low ionic strength buffer, preferably a TRIS buffer solution. The resulting product of

intermediate purity (25–60× purified) can be lyophilized and stored or can be further treated to obtain a high purity AHF (200–400× purified). High purity AHF is produced by further treating the intermediate purity product with PEG, preferably of a molecular weight of 4,000, in two steps, the first at about 6 percent and the second at about 12 percent. The high purity product is lyophilized before storage. Both the intermediate, and the high, purity AHF are used in the treatment of classical hemophilia.

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**3,652,531**

## R-GLYCYL-L-TRYPTOPHYL-L-METHIONYL-GLYCINE AMIDES AND PREPARATION THEREOF

**Munetugu Miyoshi, Nishinomiya-shi, Kouichi Niwa, Ikeda-shi, Takanobu Ohnishi, Osaka-shi, Tamotsu Danno, Moriguchi-shi, and Koh Higaki, Nara-shi, Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan**

**No Drawing. Filed Aug. 22, 1969, Ser. No. 852,492**
**Claims priority, application Japan, Aug. 24, 1968, 43/60,772**
**Int. Cl. C07c** *103/52*
**U.S. Cl. 260—112.5** **6 Claims**

A glycyl-L-tryptophyl-L-methionyl-glycine ester having a protected terminal α-amino group is amidated. A glycyl-L-tryptophyl - L - methionyl-glycine amide having a protected terminal α-amino group is produced. This compound inhibits gastric juice secretion. The terminal α-amino group is protected with an alkyl carbonyl, an alkoxycarbonyl, an aralkoxycarbonyl or an arylsulfonyl group.

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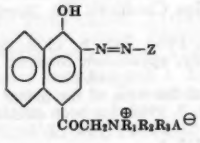
**3,652,532**

## CATIONIC AZO DYES CONTAINING AMMONIUM SALTS

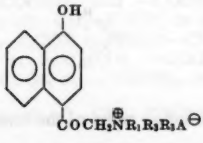
**John Blackwell, Kennett Square, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Filed Jan. 27, 1969, Ser. No. 794,407**
**Int. Cl. C09b** *29/10*
**U.S. Cl. 260—187** **6 Claims**

Cationic dyes based on (4-hydroxy-1-naphthacyl) ammonium salts and having the structure:



where $R_1$ is alkyl; $R_2$ and $R_3$ are independently alkyl or hydroxyalkyl, or together form an alicyclic ring; $A^{\ominus}$ is an anion; Z is a group of a diazo compound of the carbocyclic or heterocyclic aromatic series, free of sulfonic and carboxylic acid groups. In addition, the coupler utilized in the preparation of these dyes and having the structure:



where $R_1$ is alkyl; $R_2$ and $R_3$ are independently alkyl or hydroxyalkyl, or together form an alicyclic ring; and A is an anion, is included in the invention.

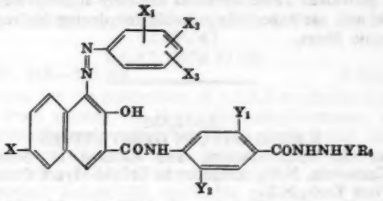
**3,652,533**

## PHENYL-AZO-HYDROXYNAPHTHOLIC ACID AMIDE PIGMENTS

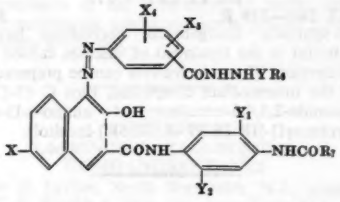
**Armand Roueche, Neu-Allschwil, Switzerland, assignor to Ciba Limited, Basel, Switzerland**

**No Drawing. Filed Nov. 19, 1968, Ser. No. 777,164**
**Claims priority, application Switzerland, Dec. 6, 1967, 17,111/67**
**Int. Cl. C07c** *107/08;* **C09b** *29/28*
**U.S. Cl. 260—203** **7 Claims**

Monoazo pigment of the formulae



and



in which X is hydrogen, bromine, nitro or lower alkoxy, Y is —CO— or —$SO_2$—, $X_1$ and $X_2$ each is hydrogen, chlorine, lower alkyl, lower alkoxy, phenoxy, chlorophenoxy, lower alkylphenoxy, nitro, lower carbalkoxy, carbophenoxy, lower alkanoylamino or trifluoromethyl, $X_3$ is hydrogen, chlorine or —$CONHR_5$ is in which $R_5$ is hydrogen, lower alkyl, phenyl or substituted phenyl, $Y_1$ and $Y_2$ each is hydrogen, chlorine or lower alkyl and $R_6$ is hydrogen, lower alkyl, phenyl or substituted phenyl, $X_4$ is chlorine, lower alkyl, lower alkoxy, lower carbophenoxy, phenoxy, chlorophenoxy or lower alkyl phenoxy, $X_5$ is hydrogen or chlorine, and $R_7$ is hydrogen, lower alkyl, amino, lower alkylamino, unsubstituted phenyl or phenylamino, substituted phenyl or substituted phenylamino; suitable for the spin-coloration of filament and staple-fibre viscose, cellulose ethers, cellulose esters, polyamides, polyurethanes and polyesters.

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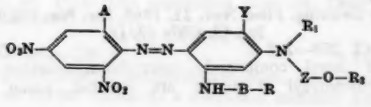
**3,652,534**

## PHENYL-AZO-PHENYL DYESTUFFS

**Hans E. Wegmuller, Riehen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland**

**No Drawing. Original application Sept. 19, 1966, Ser. No. 580,184, now Patent No. 3,533,722. Divided and this application Oct. 20, 1969, Ser. No. 871,082**
**Claims priority, application Switzerland, Sept. 24, 1965, 13,252/65**
**Int. Cl. C07c** *107/06;* **C09b** *29/24, 29/08*
**U.S. Cl. 260—207** **8 Claims**

Dyestuffs of the formula



wherein:

A represents hydrogen, chlorine or bromine, lower alkyl, lower alkoxy, lower carbalkoxy or lower alkylsulfonyl;
Y represents lower alkoxy;
B represents the —CO—, —COO— or —$SO_2$— group;
R represents lower alkyl;
Z represents alkylene having 2 to 4 carbon atoms;
$R_1$ represents phenyl-lower alkylene which may be ring-substituted by bromine, chlorine, lower alkyl or lower alkoxy; and
$R_2$ represents lower alkanoyl

are provided. These dyestuffs are only slightly water-soluble and are especially suitable for dyeing hydrophobic organic fibers.

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**3,652,535**
**KASUGAMYCIN DERIVATIVES**

**John G. Kell, Manlius, and Richard H. Schreiber, Canastota, N.Y., assignors to Bristol-Myers Company, New York, N.Y.**

**No Drawing. Filed May 1, 1970, Ser. No. 33,865**
**Int. Cl. C07c** *47/18*
**U.S. Cl. 260—210 R** **3 Claims**

Semi-synthetic kasugamycin derivatives have been found useful in the treatment of diseases caused by bacterial infection. These derivatives can be prepared by the use of the intermediate compound, Bios C (5-[2-carbobenzoxamido-2,3,4,6-tetradeoxy - 4 - amino-α-D-arabino-hexopyranosyl]-[IR:2S:3S:4R:5R:6R]-inositol).

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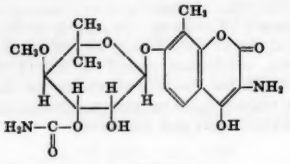
**3,652,536**
**NOVENAMINE COMPOUNDS AND DERIVATIVES**

**Oldrich K. Sebek and Herman Hoeksema, Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.**

**No Drawing. Filed June 2, 1969, Ser. No. 829,757**
**Int. Cl. C07c** *47/18*
**U.S. Cl. 260—210 R** **6 Claims**

Enzymatic cleavage of the amide bond in the antibiotic novobiocin yields novenamine, a novel compound, having the structure:



Novenamine is antibacterially active and, thus, can be used as an antibacterial agent. Further, it can be acylated to form novel compounds which possess antimicrobial properties.

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**3,652,537**
**EPIERYTHROMYCYLAMINE AND EPIERYTHROMYCYL B AMINE**

**Eddie H. Massey and Barbara S. Kitchell, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.**

**No Drawing. Filed Nov. 21, 1969, Ser. No. 878,937**
**Int. Cl. C07c** *47/18*
**U.S. Cl. 260—210 E** **3 Claims**

The novel compounds epierythromycylamine and epierythromycyl B amine are isolated, along with erythromycylamine and erythromycyl B amine, from the hydrogenation of erythromycin oxime and erythromycin B oxime. The epi amines are antibiotically active.

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**3,652,538**
**FORMULATION PROCESS FOR POLYNUCLEOTIDE HOMOPOLYMERS**

**John F. Niblack, Noank, Conn., assignor to Pfizer Inc., New York, N.Y.**

**No Drawing. Filed Aug. 8, 1969, Ser. No. 848,716**
**Int. Cl. C07d** *51/52, 51/54*
**U.S. Cl. 260—211.5 R** **2 Claims**

Clear, non-particulate, free-flowing, sterile, aqueous solutions of polyinosinic:polycytidilic acid complexes suitable for medicinial application are prepared by an improved process.

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**3,652,539**
**PROCESS FOR THE PRODUCTION OF HYDROXYPROPYL CELLULOSE**

**Kabuo Miura, Schichitaro Sekigawa, and Kyosaku Nishizawa, Niigata, and Kazuo Nishimura, Tokyo, Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan**

**Filed Mar. 9, 1970, Ser. No. 17,726**
**Int. Cl. C08b** *11/08, 11/20*
**U.S. Cl. 260—231 R** **1 Claim**

Alkali cellulose is allowed to react with 20–80% of total moles of propylene oxide and after the reaction, 60–90% of alkali component in the reaction mixture is neutralized with acid and then the remaining propylene oxide is reacted further with alkali cellulose and the remaining alkali component is finally neutralized. The produced hydroxypropyl cellulose has good solubility properties for cold water and for many kinds of organic solvents.

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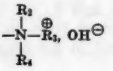
**3,652,540**
**NOVEL ION EXCHANGERS ON THE BASIS OF CELLULOSE AND A METHOD FOR PREPARING THE SAME**

**Helmut Determann, Frankfurt am Main-Niederrad, and Theodor Wieland, Heidelberg, Germany, assignors to Pharmacia Fine Chemicals AB, Bjorkgatan, Uppsala, Sweden**

**No Drawing. Filed Feb. 6, 1970, Ser. No. 9,400**
**Claims priority, application Sweden, Feb. 7, 1969, 1,646/69**
**The portion of the term of the patent subsequent to Aug. 3, 1988, has been disclaimed**
**Int. Cl. C08b** *11/04, 11/14, 29/03*
**U.S. Cl. 260—232 A** **9 Claims**

A novel ion-exchanger consisting of rounded particles of regenerated cellulose substituted by groups of the formula —$R_1$—Z, wherein $R_1$ stands for a lower alkylene group, containing 1–3 carbon atoms and optionally substituted with a hydroxyl group, and Z stands for a carboxylic, sulfo or phosphono group, or salts thereof, or an amino group of the formula

or a quaternized amino group of the formula



or salts thereof, wherein $R_2$, $R_3$ and $R_4$ each stand for hydrogen or an optionally hydroxyl group-substituted lower alkylene group, containing 1–4 carbon atoms, the substitution degree corresponding to an ion exchange capacity within the limits of 0.2–1.8 milliequivalents per gram of dry substance, preferably 0.5–1.2 milliequivalents per gram of dry substance, said particles containing from 2 to 25 percent of cellulose, calculated as unsubstituted product in weight per volume, and presenting pores substantially in the range of from 2 to 2000 mμ is disclosed.

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3,652,541

## ETHERIFIED DEPOLYMERIZED STARCH PRODUCT COMPATIBLE WITH POLYVINYL ALCOHOL

**Erling T. Hjermstad and Leonard J. Coughlin, Cedar Rapids, Iowa, assignors to Penick & Ford Limited, Cedar Rapids, Iowa**

**No Drawing. Filed Jan. 26, 1970, Ser. No. 5,971**

**Int. Cl. C08b** *19/06*

**U.S. Cl. 260—233.3 R** **7 Claims**

An etherified depolymerized starch product exhibiting compatibility with aqueous polyvinyl alcohol solutions useful for size or adhesive application, said starch product consisting essentially of starch containing acid salt radicals selected from —$SO_3X$, or $SO_2X$ and —COOX, wherein X is a cation selected from $Na^+$, $K^+$, or $NH_4^+$, in the amount of .45 to 4.5% by weight based on said product of —$SO_3Na$, or molar equivalents of —$SO_3K$, —$SO_3NH_4$, —COONa, —COOK, or —$COONH_4$, said —$SO_3X$ radical being present in ether-linked groups containing from 2 to 3 carbons, said mixture containing at least .15% —$SO_3Na$ radicals, or molar equivalents of —$SO_3K$ or —$SO_3NH_4$, said —COOX radicals being present as

starch—O—COOX

said starch product being further characterized by an alkali fluidity of less than 95 and above 5 and by being substantially free of inorganic salts.

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3,652,542

## PROCESS FOR PREPARING ETHERIFIED DEPOLYMERIZED STARCH PRODUCT COMPATIBLE WITH POLYVINYL ALCOHOL

**Erling T. Hjermstad and Leonard J. Coughlin, Cedar Rapids, Iowa, assignors to Penick & Ford Limited, Cedar Rapids, Iowa**

**No Drawing. Filed July 15, 1969, Ser. No. 841,961**

**Int. Cl. C08b** *19/06*

**U.S. Cl. 260—233.3 R** **5 Claims**

An etherified depolymerized starch product exhibiting compatibility with aqueous polyvinyl alcohol solutions useful for size or adhesive application, said starch product consisting essentially of starch containing —COOX groups, wherein X is a cation selected from $Na^+$, $K^+$, or $NH_4^+$, in the amount of 0.3 to 3% by weight based on said product of —COONa, or molar equivalent of —COOK or —$COONH_4$, said —COOX groups being present as starch—O—$CH_2$—COOX, or as a mixture of starch—O—$CH_2$—COOX and starch—COOX, said mixture containing at least 0.1% —COONa, or molar equivalent of —COOK or —$COONH_4$, as said

starch—O—$CH_2$—COOX

said starch product being further characterized by an alkali fluidity of less than 95 and above 5 and by being substantially free of inorganic salts. The corresponding starch—O—$CH_2CH_2$—COOX groups can be substituted for the starch—O—$CH_2$—COOX groups.

**ERRATUM**

For Class 260—239 see:
Patent No. 3,652,754

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3,652,543

## PROCESS FOR THE PRODUCTION OF 1,2,4,5-TETRAHYDRO-3-AZEPINES

**Karl Hoegerle, Basel, Switzerland, assignor to Geigy Chemical Corporation, Ardsley, N.Y.**

**No Drawing. Filed Feb. 15, 1968, Ser. No. 705,612**

**Claims priority, application Switzerland, Feb. 17, 1967, 2,386/67**

**Int. Cl. C07d** *41/08*

**U.S. Cl. 260—239 BB** **3 Claims**

Process for the production of 1,2,4,5-tetrahydro-3-azepines from styrene via N-aziridinyl-alkyl-benzenes, and halogeno-alkylamino-alkyl-benzenes, which latter intermediates are useful as herbicides; from the latter, the corresponding 1,2,4,5-tetrahydro-3-azepines are obtained in a simple, industrially applicable process and in very satisfactory yields. 1,2,4,5-tetrahydroazepines are useful as intermediates in the production of antihypertensive agents, hypoglycemic agents and some possess themselves anorexogenic properties.

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3,652,544

## 3,4-BISNOR-5-AZA-B-HOMO-D-HOMOANDROSTANES

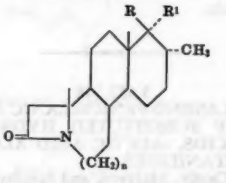
**Seymour D. Levine, North Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.**

**No Drawing. Filed Dec. 18, 1968, Ser. No. 784,883**

**Int. Cl. C07d** *25/02*

**U.S. Cl. 260—239 A** **4 Claims**

This invention relates to the preparation of novel steroidal β-lactams having the formula:




wherein R is hydroxy or acyloxy and $R^1$ is hydrogen and R and $R^1$ together are oxo (O=) and *n* represents 1 or 2. The β-lactams of this invention are physiologically active materials possessing antiandrogenic activity.

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3,652,545

## PROCESS FOR PREPARING N-(6-AMINOHEXYL) HEXAMETHYLENEIMINE

**Theodore Horlenko and Hopkins W. Tatum, Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.**

**No Drawing. Continuation-in-part of application Ser. No. 509,242, Oct. 14, 1965, now Patent No. 3,524,892, which is a division of application Ser. No. 238,293, Nov. 16, 1962, now Patent No. 3,268,588, which in turn is a continuation-in-part of application Ser. No. 860,349, Dec. 18, 1959. This application Nov. 28, 1969, Ser. No. 880,979**

**Int. Cl. C07d** *41/04*

**U.S. Cl. 260—239 B** **4 Claims**

N-(6-aminohexyl) hexamethyleneimine, a new composition of matter useful as a corrosion inhibitor and as

a component of lubricants for pumps and compressors handling process streams in the ammonolysis of 1,6-hexanediol to produce hexamethylenediamine and related compounds, is produced by reacting hexamethylenediamine, hexamethyleneimine, or a mixture of these compounds in the presence of ammonia and a catalyst selected from the group consisting of Raney nickel, Raney cobalt, and Raney nickel or kieselguhr. In a specific embodiment the compound is produced by the catalytic ammonolysis of 1,6-hexanediol to form a mixture of products which then react further to form the N-(6-aminohexyl) hexamethyleneimine. Hexamethylenediamine can be withdrawn from the reaction product for use as such; at least a portion of the hexamethyleneimine contained in the product is preferably recycled to the reaction zone for further conversion to N-(6-aminohexyl) hexamethyleneimine.

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**3,652,546**
**ESTERS OF 6-AMINOPENICILLANIC ACID**

**Lee C. Cheney, Fayetteville, John C. Godfrey, Syracuse, Leonard B. Crast, Jr., North Syracuse, and Joyce R. Luttinger, Syracuse, N.Y., assignors to Bristol-Myers Company, New York, N.Y.**

**No Drawing. Filed July 22, 1965, Ser. No. 474,155**
**Int. Cl. C07d *99/14***
**U.S. Cl. 260—239.1** **13 Claims**

Activated esters of 6-aminopenicillanic acid are useful as intermediates in the production of penicillins.

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**3,652,547**
**3-QUINAZOLINYLPENICILLANIC ACID**

**Milton Wolf, West Chester, James L. Diebold, Havertown, and Stanley C. Bell, Penn Valley, Pa., assignors to American Home Products Corporation, New York, N.Y.**

**No Drawing. Filed Dec. 17, 1969, Ser. No. 886,018**
**Int. Cl. C07d *99/16***
**U.S. Cl. 260—239.1** **6 Claims**

This invention is concerned with novel 3-quinazolinylpenicillanic acids.

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**3,652,548**
**6-CARBONYLAMINO PENICILLANIC ACID DERIVATIVES OF SUBSTITUTED HYDROXYAMINOACETIC ACIDS, -ACETIC ACID ALKYL ESTERS AND -ACETANILIDES**

**Ronald J. McCaully, Malvern, and Stanley C. Bell, Penn Valley, Pa., assignors to American Home Products Corporation, New York, N.Y.**

**No Drawing. Filed Dec. 17, 1969, Ser. No. 886,019**
**Int. Cl. C07d *99/16***
**U.S. Cl. 260—239.1** **6 Claims**

This invention relates to novel 6-carbonylamino penicillanic acid derivatives of substituted hydroxyamino acetic acids, hydroxyamino acetic acid alkyl esters, and hydroxyaminoacetanilides.

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**3,652,549**
**PRODUCTION OF ε-CAPROLACTAM**

**Isamu Fujita, Ishibashi Ikeda, and Kiyoshi Otoi, Kuwatacho, Ibaraki, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan**

**No Drawing. Filed July 18, 1968, Ser. No. 745,702**
**Int. Cl. C07d *41/06***
**U.S. Cl. 260—239.3** **13 Claims**

ε-Caprolactam, useful as a raw material in the manufacture of nylon, is prepared by the gaseous catalytic reaction of at least one compound of the formula

$$X—(CH_2)_4COY$$

wherein X is $—CH_2OH$, —CHO, —(CH(OR)(OR'), —COOH, $—COONH_4$, $—CONH_2$ or COOR'', Y is —OH, $—ONH_4$, $—NH_2$ or —OR''' and each of R, R', R'' and R''' is methyl, ethyl, propyl, butyl or cyclohexyl, with ammonia, hydrogen and/or steam in the presence of a copper-chromite catalyst.

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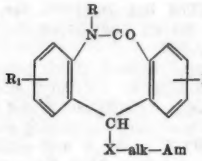
**3,652,550**
**11-AMINOALKYL ETHERS OF 6-MORPHANTHRIDONES**

**Gordon Northrop Walker, Morristown, N.J., assignor to Ciba Corporation, Summit, N.J.**

**No Drawing. Filed Nov. 19, 1968, Ser. No. 777,146**
**Int. Cl. C07d *41/00***
**U.S. Cl. 260—239.3** **11 Claims**

11-aminoalkyl ethers of 5,6-dihydro-6-morphanthridones, e.g. those having the formula




X=O or S
alk=lower alkylene with at least 2C
Am=an amino group
R=H or alkyl
$R_{1,2}$=H, alkyl, alkoxy, alkylmercapto, halogeno, $CF_3$, $NO_2$ or amino acyl derivatives, iminoethers, salts and quaternaries thereof decrease gastric secretion.

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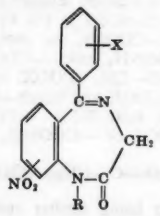
**3,652,551**
**PROCESS FOR PRODUCING 1-ALKYL-NITRO-BENZODIAZEPINE DERIVATIVES**

**Hisao Yamamoto, Nishinomiya-shi, Shigeho Inaba, Takarazuka-shi, Tadashi Okamoto, Ashiya-shi, Toshiyuki Hirohashi, Kobe, Kikuo Ishizumi, Minoo-shi, Michihiro Yamamoto, Takarazuka-shi, Isamu Maruyama, Minoo-shi, Kazuo Mori, Kobe, and Tsuyoshi Kobayashi, Minoo-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan**

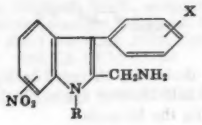
**No Drawing. Filed Nov. 20, 1968, Ser. No. 777,458**
**Claims priority, application Japan, Dec. 1, 1967, 42/77,237; Dec. 9, 1967, 42/79,166; Dec. 14, 1967, 42/80,322; Dec. 15, 1967, 42/80,512, 42/80,513; Dec. 21, 1967, 42/82,273; Dec. 28, 1967, 43/84,961; Jan. 10, 1968, 43/11,501; Mar. 11, 1968, 43/16,033**
**Int. Cl. C07d *53/06***
**U.S. Cl. 260—239.3** **25 Claims**

Benzodiazepine derivatives, which have been well known as excellent tranquillizers and which have the formula:



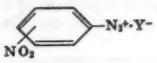

wherein R signifies a methyl, ethyl or the like group; and X signifies a hydrogen, chlorine or the like atom, are obtained by reacting with an oxidizing agent, such as

chromic acid or the like, a novel 2-aminomethyl-indole derivative of the formula:

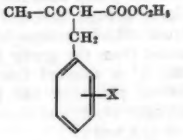


wherein R and X have the same significances as mentioned above, or its salt.

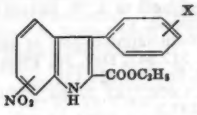
The starting 2-aminomethylindole derivative is prepared by reacting a nitrobenzenediazonium derivative of the formula:



wherein Y signifies a halogen atom, with an ester of β-keto-acid of the formula:



wherein X has the same significance as mentioned above, to form an indole-2-carboxylic acid ester derivative of the formula:



wherein X has the same significance as mentioned above, subjecting said derivative to N-alkylation, hydrolysis, and amidation to form a corresponding acid amide, dehydrating said acid amide to a corresponding carbonitrile, and then reducing said carbonitrile.

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**3,652,552**
**PREPARATION OF LACTAMS FROM CYCLOALKANES**

**Johan W. Garritsen, Geleen, and Johannes H. A. Hofman, Maastricht, Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands**

**No Drawing. Filed Dec. 18, 1967, Ser. No. 691,194**
**Claims priority, application Netherlands, Dec. 16, 1966, 6617753, 6617754**
**Int. Cl. C07d** *29/16*
**U.S. Cl. 260—239.3** **16 Claims**

A process for producing lactams from cycloalkanes is disclosed. Cycloalkanes are reacted with nitrosyl chloride while subjected to irradiation, in the presence of a nitrile which does not contain any methylene groups capable of reacting with nitrosyl under the reaction conditions. ω-Lactams are directly produced by heating the reaction product.

**3,652,553**
**PROCESS FOR THE PRODUCTION OF CAPROLACTAM**

**Manfred Mansmann, Krefeld-Bockum, Otto Immel, Krefeld-Uerdingen, and Hans Zirngibl, Duisburg, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany**

**No Drawing. Filed Dec. 8, 1969, Ser. No. 883,269**
**Claims priority, application Germany, Dec. 13, 1968, P 18 14 489.3**
**Int. Cl. C07d** *41/06*
**U.S. Cl. 260—239.3** **2 Claims**

An improvement for the process to produce lactams by catalytically rearranging cyclic ketoximes by passing a gas mixture consisting of a gaseous cyclic ketoxime and steam or a mixture of a gaseous cyclic ketoxime, steam and an inert gas over a boron oxide catalyst at temperatures of from 200 to 400° C. and recovering the lactam from the gas mixture thus obtained. Before passing the steam over the boron oxide catalyst they are saturated with boron oxide by passing over the X-ray crystalline modification of boron oxide at a temperature of from 200 to 450° C.

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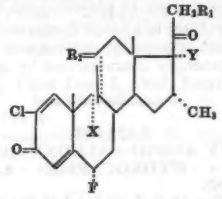
**3,652,554**
**HALOGEN-PREGNADIENES**

**Georg Anner, Ludwig Ehmann, and Jaroslav Kalvoda, Basel, Switzerland, assignors to Ciba Corporation, Summit, N.J.**

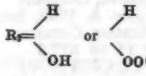
**No Drawing. Filed Nov. 15, 1968, Ser. No. 776,270**
**Claims priority, application Switzerland, Nov. 17, 1967, 16,101/67**
**Int. Cl. C07c** *169/28*
**U.S. Cl. 260—239.55** **12 Claims**

Compounds of the formula



wherein

$R_1$=free, esterified or etherified hydroxyl



X=H or F; or

$R_2$+X represents a 9,11-double bond or a 9β,11β-oxido group and

Y=H, free or esterified hydroxyl

for example Δ[1,4]-2-chloro-6α,9α-difluoro-16α-methyl-3,20-dioxo-11β,17α-dihydroxy-21-acetoxypregnadiene.

Use: as corticoid analogous and antiphlogistics.

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**3,652,555**
**1,2-DISUBSTITUTED-5-NITROIMIDAZOLES**

**Jay Donald Albright, Nanuet, and Robert Gordon Shepherd, South Nyack, N.Y., assignors to American Cyanamid Company, Stamford, Conn.**

**No Drawing. Filed June 16, 1969, Ser. No. 833,683**
**Int. Cl. C07d** *49/36*
**U.S. Cl. 260—240 D** **6 Claims**

Methods of preparing 2-cyano-1-loweralkyl-5-nitroimidazoles and 1-lower-alkanoyloxy-lower-alkyl-2-cyano-5-nitroimidazoles and novel intermediates resulting from related 1-substituted-2-methyl-5-nitroimidazoles are described. Some of the compounds are active as analgesics,

antiparasitics and diuretics and others are useful as intermediates to produce antibacterial agents such as 2-(2-amino-5-thiadiazolyl)-1-methyl-5-nitroimidazole.

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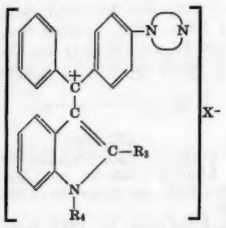
## 3,652,556
## AMINODIPHENYL-INDOLYL-METHANE DYESTUFFS

**Hans-Peter Kühlthau and Roderich Raue, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany**

**No Drawing. Filed Mar. 29, 1968, Ser. No. 717,393**
**Claims priority, application Germany, Apr. 10, 1967, F 52,081**
**Int. Cl. C07d** *29/26, 51/70, 87/38*
**U.S. Cl. 260—242** **4 Claims**

Dyestuffs of the general formula



are prepared which are adapted for use in dyeing and printing materials made of leather, tannin treated cotton, cellulose acetate, synthetic super polyamides and polyurethanes and for the dyeing of lignin-containing fibers as well as for use in preparing ink-type materials. As dyestuffs the materials are characterized by good fastness to light, wet processing, rubbing and sublimination, and they are generally characterized by good affinity to the subject fibers.

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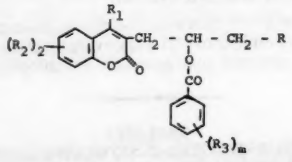
## 3,652,557
## 3-[γ-TERTIARY AMINO-β-ALKOXY BENZOYLOXY-PROPYL] - 4 - HYDROCARBON - 5,8 - ALKOXY COUMARINS

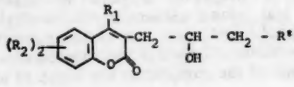
**Rudi Beyerle, Bruchkobel, and Adolf Stachel, Rolf-Eberhard Nitz, Klaus Resag, and Eckard Schraven, Frankfurt am Main-Fechenheim, Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt am Main-Fechenheim, Germany**

**No Drawing. Filed Jan. 8, 1969, Ser. No. 789,919**
**Claims priority, application Germany, Jan. 19, 1968, P 16 68 877.0**
**Int. Cl. C07d** *87/42*
**U.S. Cl. 260—247.2 B** **3 Claims**

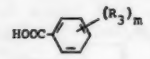
The present invention relates to new coumarin compounds useful as coronary dilators and having the formula



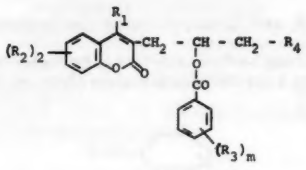
or the hydrochloric acid addition salts thereof, and to methods of preparing same either by acylating, in the presence of acid-binding agents, if desired, coumarin derivatives having the formula



with acylating agents selected from the group consisting of alkoxybenzoic acid having the formula



and functional derivative thereof, or by condensing, in the presence of acid-binding agents, if desired, coumarin derivatives having the formula



with an amine having the formula RH, wherein R is a radical selected from the group consisting of morpholino, piperidino and pyrrolidine, which is bound via a nitrogen atom; $R_1$ is selected from the group consisting of alkyl radicals having 1–4 carbon atoms and phenyl radicals; $R_2$ is selected from the group consisting of 5,7-, 6,7- and 7,8-positioned alkoxy groups having 1–4 carbon atoms; $R_3$ is selected from alkoxy groups having 1–4 carbon atoms; $R_4$ is selected from the group consisting of chlorine and bromine; R′ is selected from the group consisting of morpholino, piperidino and pyrrolidino, which is bound via a nitrogen atom; and *m* is selected from the group consisting of 1, 2, and 3.

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## 3,652,558
## SPIRO CONDENSED AROMATIC COMPOUNDS

**Carl Dalton Lunsford, Richmond, Albert Duncan Cale, Jr., Mechanicsville, and Norman David Dawson, Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 517,842, Dec. 30, 1965. This application Apr. 21, 1969, Ser. No. 818,134**
**Int. Cl. C07d** *7/42, 27/04, 27/08, 65/16*
**U.S. Cl. 260—247.2** **9 Claims**

Novel spiro condensed aromatic compounds prepared by intramolecular rearrangement of

9-(1-substituted-3-pyrrolidinyl)fluorene-9-carboxylic acids,
9-(1-substituted-3-pyrrolidinyl)thioxanthene-9-carboxylic acids,
9-(1-substituted-3-pyrrolidinyl)xanthene-9-carboxylic acids, and
5-(1-substituted-3-pyrrolidinyl)-5H-dibenzo[a,d]-dihydrocycloheptene-5-carboxylic acids

useful as sedatives and antidepressants are disclosed.

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## 3,652,559
## DIAMINOCYCLOALKANES

**Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**No Drawing. Continuation-in-part of application Ser. No. 638,611, May 15, 1967. This application May 13, 1968, Ser. No. 728,779**
**Int. Cl. C07d** *87/38*
**U.S. Cl. 260—247.5 R** **33 Claims**

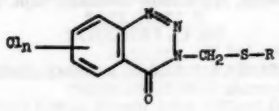
Cis- and trans-diaminocycloalkanes, acid addition and quaternary ammonium salts thereof. The novel compounds are useful as tertiary amines and catalysts. In addition, many of the 1,2- and 1,3-diaminocycloalkanes exhibit activity as central nervous system stimulants, diuretics, anorexigenic and antidiabetic agents.

## 3,652,560
## 3-[(ALKYLTHIO)METHYL]-1,2,3-BENZOTRIAZIN-4(3H)-ONES

John E. Livak, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed June 18, 1970, Ser. No. 47,603
Int. Cl. C07d 55/08
U.S. Cl. 260—248 AS 5 Claims

Disclosed are compounds corresponding to the formula



wherein R represents loweralkyl of 1 to 4 carbon atoms, inclusive, and *n* represents an integer of 0, 1 or 3, the method of preparation and the use of these compounds as fungicides.

## 3,652,561
## 2,4,6-TRIS-(ALKYLTHIOALKYLTHIO)-1,3,5-TRIAZINES

Martin Dexter, 416 Cedar Drive, Briarcliff Manor, N.Y. 10510, and Martin Knell, 4 Possum Road, Ossining, N.Y. 10562

No Drawing. Filed July 23, 1969, Ser. No. 844,744
Int. Cl. C07d 55/50
U.S. Cl. 260—248 CS 9 Claims

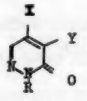
2,4,6-tris-(alkylthioalkylthio)-1,3,5-triazines are prepared by reacting cyanuric chloride, an alkylthioalkylmercaptan and a base. Said compounds are useful as stabilizers of organic material subject to oxidative deterioration and particularly as synergists in combination with other stabilizers.

## 3,652,562
## PYRIDAZONE DERIVATIVES

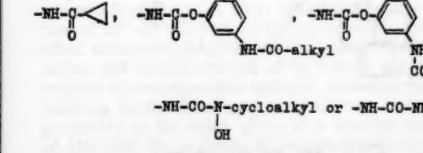
Franz Reicheneder and Rudolf Kropp, Ludwigshafen, and Adolf Fischer, Mutterstadt, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Mar. 9, 1970, Ser. No. 17,923
Claims priority, application Germany, Mar. 13, 1969, P 19 12 770.9
Int. Cl. C07d 51/04
U.S. Cl. 260—250 A 6 Claims

New and valuable pyridazone derivatives having the formula



where R denotes a phenyl or aralkyl radical which may be substituted by halogen, alkyl, alkoxy or haloalkyl, a cyclohexyl radical which may be substituted by halogen or alkyl, Y denotes hydrogen, halogen, alkoxy or mercaptoalkyl, X denotes the groups



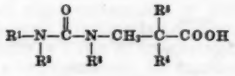
and, when Y denotes hydrogen or R denotes aralkyl, X may additionally denote the amino or acetylamino group, and a process for controlling the growth of unwanted plants with these compounds.

## 3,652,563
## 2-OXO-HEXAHYDROPYRIMIDYL-N,N'-ALKANOIC ACIDS

Harro Petersen and Klaus-Christian Renner, Frankenthal, Pfalz, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

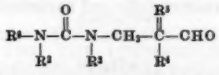
No Drawing. Filed Aug. 8, 1968, Ser. No. 751,071
Claims priority, application Germany, Aug. 9, 1967, P 16 70 263.9
Int. Cl. C07d 51/18
U.S. Cl. 260—251 R 5 Claims

Ureidopropionic acids of the formula:



(I)

wherein $R^1$ to $R^5$ denote identical or different aliphatic, cycloaliphatic, araliphatic or aromatic radicals, said ureidopropionic acids being prepared by reacting a ureidopropionaldehyde having the formula:



(II)

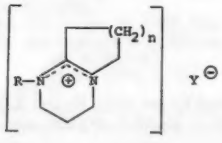
with an oxidizing agent at a temperature of from 0° to 100° C., said acids being useful as paper finishing agents and as starting materials for the production of paper finishing agents and herbicides.

## 3,652,564
## 5-ALKYL-1,6-FUSED CYCLOALKYLENE-TETRAHYDRO-1,5-DIAZINE SALTS

David J. Ellis, Mountain View, and David Rammler, Palo Alto, Calif., assignors to Syntex Corporation, Panama, Panama

No Drawing. Filed Dec. 1, 1969, Ser. No. 881,299
Int. Cl. C07d 51/46
U.S. Cl. 260—251 A 17 Claims

Quaternary ammonium salts of the formula:



wherein R is a straight or branched alkyl group having between 10 to 24 carbon atoms in the straight chain, *n* is a positive integer of from 1 to 3; Y is an acceptable ion; and the broken line (— — —) indicates that the carbon-nitrogen double bond resonates between the two nitrogen atoms and the positive charge is distributed between the two nitrogens;
and methods of preparing such methods by the reaction of a diazabicycloalkene with a substituted alkane. The compounds have utility as anti-bacterial agents.

## 3,652,565
## NOVEL DIBASIC ACID COMPOUNDS AND MEANS FOR THE PRODUCTION THEREOF

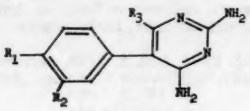
John Davoll, Shepperton, Middlesex, and Anthony Michael Johnson, Twickenham, Middlesex, England, assignors to Parke, Davis & Company, Detroit, Mich.

No Drawing. Filed July 29, 1969, Ser. No. 845,886
Claims priority, application Great Britain, Nov. 1, 1968, 51,867/68
Int. Cl. C07d 51/42
U.S. Cl. 260—256.4 N 8 Claims

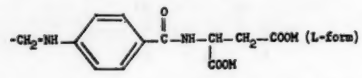
Novel pyrimidinylbenzylaminobenzoyl aspartic acid compounds (I), di-salts, and acid addition salts are pro-

vided by hydrolysis of corresponding compounds having groups hydrolyzable to aspartic acid carboxyl groups

(I)



where one of $R_1$ and $R_2$ is the group



(II)

and the other of $R_1$ and $R_2$ is H or $C_{1-4}$ alkyl or alkoxy, $R_3$ is H or $C_{1-4}$ alkyl, and M is H or a cation. The compounds have antimetabolic and bacteriostatic properties and are useful antimetabolic and bacteriostatic agents.

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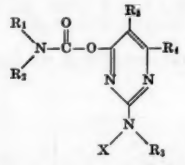
**3,652,566**

## 2-ACYLAMINO PYRIMIDIN-4YL CARBAMATES

**Ranajit Ghosh and Nigel Douglas Bishop, Wokingham, and Derek John William Bullock, Marlow, England, assignors to Imperial Chemical Industries Limited, London, England**

**No Drawing. Filed Sept. 29, 1969, Ser. No. 862,008**
**Claims priority, application Great Britain, Oct. 29, 1968, 51,274/68**
**Int. Cl. C07d**
**U.S. Cl. 260—256.4 C** **3 Claims**

Pesticidally active pyrimidine derivative of formula:



wherein $R_1$, $R_2$ and $R_3$ are alkyl, $R_5$ and $R_6$ are hydrogen, alkyl, cyanoalkyl or together alkylene, and X is acyl.

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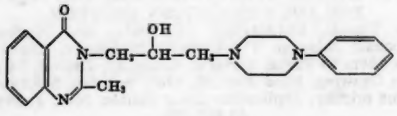
**3,652,567**

## QUINAZOLINONE DERIVATIVE AND PROCESS FOR THE PRODUCTION THEREOF

**Karl-Heinz Boltze, Bensberg-Kippekausen, and Dietrich Lorenz, Kleinhurden Post, Immekeppel, near Bensberg, Germany, assignors to Troponwerke Dinklage & Co., Cologne-Mulheim, Germany**

**No Drawing. Filed Oct. 15, 1969, Ser. No. 866,719**
**Claims priority, application Germany, Oct. 16, 1968, P 18 03 210.5**
**Int. Cl. C07d** *51/48*
**U.S. Cl. 260—256.4 Q** **1 Claim**

A quinazolinone compound of the formula:



2-methyl-3-{3-[4-phenylpiperazinyl-(1)] - 2 - hydroxypropyl}-quinazoline-4-one. This compound has antitussive and analgesic activity.

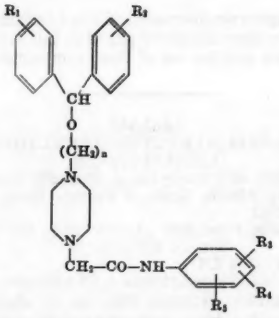
**3,652,568**

## DIPHENYL METHOXYALKYL-PIPERAZINYL - 4-ACETIC ACID-ANILIDE COMPOUNDS AND THERAPEUTIC COMPOSITIONS

**Werner Winter and Max Thiel, Mannheim, Kurt Stach, Wolfgang Schaumann, and Karl Dietmann, Mannheim-Waldhof, and Wolfgang Juhran, Mannheim, Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany**

**No Drawing. Filed Sept. 15, 1969, Ser. No. 858,169**
**Claims priority, application Germany, Sept. 21, 1968, P 17 95 375.2**
**Int. Cl. C07d** *51/70*
**U.S. Cl. 260—268 BZ** **10 Claims**

Basic ethers characterized by coronary dilating activity having the formula:



wherein $R_1$ and $R_2$ each designate hydrogen, halogen or lower alkyl, $R_3$, $R_4$ and $R_5$ each designate hydrogen, halogen, lower alkyl, alkoxy or trifluoromethyl, and *n* is 2 or 3, and non toxic salts of said baisc ethers.

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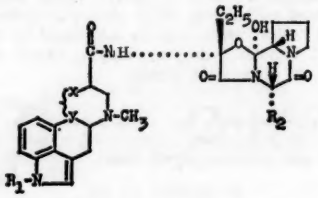
**3,652,569**

## ERGONINE, ERGOPTINE AND THE 1-METHYL AND 9,10-DIHYDRO DERIVATIVES THEREOF

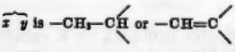
**Paul Stadler, Biel-Benken, Hartmut Hauth, Riehen, Gernot Wersin, Bottmingen, Stephan Guttmann, Allschwil, Albert Hofmann, Bottmingen, Peter Stutz, Basel, and Hans Willems, Allschwil, Switzerland, assignors to Sandoz Ltd., also known as Sandoz AG, Basel, Switzerland**

**No Drawing. Continuation-in-part of application Ser. No. 747,819, July 26, 1968. This application Jan. 21, 1971, Ser. No. 108,641**
**Claims priority, application Switzerland, Aug. 2, 1967, 10,900/67**
**Int. Cl. C07d** *51/72*
**U.S. Cl. 260—268 PE** **14 Claims**

The invention concerns new ergot peptide alkaloids of the formula



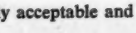
wherein



$R_1$ is hydrogen or methyl, and
$R_2$ is isopropyl or isobutyl,

and pharmaceutically acceptable and addition salts thereof.

The compounds are useful in the treatment of migraine. Compounds in which



$R_1$ is hydrogen and $R_2$ has the above significance are also vasoconstrictors. Furthermore, compounds in which $R_1$ is hydrogen are also diuretics.

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3,652,570

## 1 CYCLOALKYLAMINO 3,4 DIHYDRO ISOQUINOLINES

**Maurice Ward Gittos, Slough, John William James, Langley, and John Pomfret Verge, Middle Assendon, near Henley, England, assignors to Aspro-Nicholas Limited, London, England**

**No Drawing. Filed Mar. 10, 1969, Ser. No. 805,868**
**Claims priority, application Great Britain, Mar. 9, 1968, 11,633/68**
**Int. Cl. C07d *35/14***
**U.S. Cl. 260—288 R** **5 Claims**

Novel 1-amino derivatives of 3,4-dihydroisoquinoline and 4,5-dihydro-3H-2-benzazepines are provided together with a process by which they may be prepared from the corresponding 1-thio; lower alkylthio- or arylthioimidates. The 1-amino derivatives possess hypotensive activity.

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3,652,571

## PRODUCTION OF 2,4-DIHYDROXYQUINOLINES

**Hans Juergen Sturm, Grunstadt, and Helmut Goerth, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany**

**No Drawing. Filed May 22, 1969, Ser. No. 827,020**
**Claims priority, application Germany, May 22, 1968, P 17 70 482.4**
**Int. Cl. C07d *33/38***
**U.S. Cl. 260—289 R** **4 Claims**

Production of 2,4-dihydroxyquinolines or derivatives thereof starting from benzoxazinones and using a strong base.

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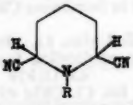
3,652,572

## PROCESS FOR THE PRODUCTION OF 2,6-DICYANOTRICHLOROPYRIDINE FROM A 2,6-DICYANOPIPERIDINE COMPOUND

**Thomas A. Magee, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio**

**No Drawing. Filed Apr. 6, 1970, Ser. No. 26,141**
**Int. Cl. C07d *31/46***
**U.S. Cl. 260—294.9** **9 Claims**

A two-stage process is described for preparing 2,6-dicyanotrichloropyridine which consists essentially of reacting, in the first stage, a 2,6-dicyanopiperidine compound having the structural formula



wherein R=H or $C_{1-5}$ alkyl, with chlorine at a temperature of 20°–80° C. with the aid of ultraviolet radiation to effect substantial dehydrogenation together with aromatization and perchlorination of at least a portion of the original dicyanopiperidine material; thereafter reacting the resulting partly chlorinated product mass with chlorine, preferably in the vapor phase at a reaction temperature of 150–500° C., to obtain 2,6-dicyanotrichloropyridine of high purity in at least 50 percent yield. The compound produced by the claimed process is an important industrial biocidal agent. It is known to exhibit fungicidal, pesticidal and herbicidal activity.

3,652,573

## N-[3-(4 - PYRAZOLYL) - 3-OXO- OR -3-HYDROXYPROPYL]AZACYCLOALIPHATIC COMPOUNDS

**Vishwa Prakash Arya, Bombay, India, assignor to Ciba Limited, Basel, Switzerland**

**No Drawing. Filed Feb. 13, 1968, Ser. No. 705,013**
**Claims priority, application Switzerland, Mar. 1, 1967, 2,975/67; Jan. 24, 1968, 1,061/68**
**Int. Cl. C07d *31/42***
**U.S. Cl. 260—295 S** **5 Claims**

The compounds of the formula

$$Pyr—C(=X)—Alk—CH(R)—N=Z \qquad (A)$$

in which N=Z denotes an N-azacycloaliphatic residue containing 5–8 ring members and at most one carbon-carbon double bond, Pyr denotes a 4-pyrazolyl residue, X stands for oxygen or a free or substituted hydroxyl group together with a hydrogen atom, Alk represents a 1:1-lower alkylidene residue, and R denotes a hydrogen atom or a lower alkyl group, or salts thereof have antihypertensive, as well as antitussive or antiinflammatory properties.

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3,652,574

## CERTAIN 1,2,3,4 - TETRAHYDRO-5H-PYRIDO[4,3-b] INDOLES AND THE CORRESPONDING 1,2,3,4-TETRAHYDRO-9H-PYRIDO[3,4-b]INDOLES AND DERIVATIVES THEREOF

**David L. Garmaise, Montreal, Quebec, Canada, assignor to Abbott Laboratories, Chicago, Ill.**

**No Drawing. Filed Apr. 1, 1970, Ser. No. 24,874**
**Int. Cl. C07d *31/42***
**U.S. Cl. 260—296 A** **5 Claims**

A new series of closely related compounds, the $\beta$- and $\gamma$-carbolines, carrying simple substituents in specific positions of the molecule were found to be highly effective against *T. cruzi* in very low concentrations.

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3,652,575

## PHENYLPYRIDINE-ALKANOLS AND DERIVATIVES THEREOF

**Jonathan Hutton and Gilbert Joseph Stacey, Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England**

**No Drawing. Filed Sept. 9, 1968, Ser. No. 758,581**
**Claims priority, application Great Britain, Sept. 26, 1967, 43,677/67**
**Int. Cl. C07d *31/34***
**U.S. Cl. 260—297 R** **3 Claims**

This invention relates to new heterocyclic compounds, and more particularly to new phenyl-heterocyclic-alkanol derivatives, which have anti-inflammatory, analgesic and antipyretic activity.

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3,652,576

## CERTAIN 1,2,3,6 OR 1,2,5,6-TETRAHYDROPYRIDINE INTERMEDIATES

**Harry G. Pars, Lexington, and Raj K. Razdan, Belmont, Mass., assignors to Beecham Group Limited, Brentford, England**

**No Drawing. Application May 1, 1969, Ser. No. 821,125, which is a continuation-in-part of application Ser. No. 707,448, Feb. 23, 1968. Divided and this application Aug. 20, 1969, Ser. No. 862,140**
**Int. Cl. C07d *31/28***
**U.S. Cl. 260—297 R** **9 Claims**

Novel compounds having beneficial central nervous system activity and useful as analgesics are provided as well as their stereo- and geometric isomers, the compounds being 3,4,5,6 - tetrahydro - 2,6 - methano-2H-1,5-benzoxazocin derivatives and intermediates therefor and procedure for making the same. Typical compounds are 2,5-dimethyl - 3,4,5,6 - tetrahydro - 2,6-methano-2H-1,5-benzoxazocin-7-ol and 2,8-dimethyl-3,4,5,6 - tetrahydro-2,6-methano-2H-1,5-benzoxazocin. The compounds may

be in the form of acid-addition salts and N-oxides and are formulated with the usual excipients or carriers into unit dosage form.

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**3,652,577**
**CERTAIN 3-ALKYL-2-ALKYLIMINO-4-HALOPHENYLTHIAZOLIDIN-4-OLS**
**Robert E. Manning, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.**
**No Drawing. Continuation-in-part of application Ser. No. 780,236, Nov. 29, 1968. This application July 28, 1969, Ser. No. 845,535**
**Int. Cl. C07d *91/16***
**U.S. Cl. 260—306.7** **3 Claims**

Substituted 2-alkyliminothiazolidinols, e.g., 4-p-chlorophenyl-3-methyl-2-methyliminothiazolidin-4-ol, are useful as anorexics, CNS stimulants and anti-inflammatory agents.

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**3,652,578**
**[ANTHRACENOTRIAZOLE]BENZOIC ACID DERIVATIVES**
**Hubert Linares, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France**
**No Drawing. Filed July 30, 1969, Ser. No. 846,279**
**Claims priority, application France, Aug. 1, 1968, 161,552**
**Int. Cl. C07d *55/02*; C09k *1/02***
**U.S. Cl. 260—308 B** **5 Claims**

[Anthraceno(1,2 - d)triazole(1,2,3)]benzoic acids and their esters, which are novel, are useful optical bluing agents for synthetic fibres.

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**3,652,579**
**1-METHYL-2-SUBSTITUTED 5-NITROIMIDAZOLES**
**Max Hoffer, Nutley, and Alexander MacDonald, Jr., Fairfield, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.**
**No Drawing. Filed June 26, 1969, Ser. No. 836,942**
**Int. Cl. C07d *49/36***
**U.S. Cl. 260—309** **10 Claims**

Novel 1-methyl-2-substituted 5-nitroimidazoles, novel intermediates therefor and processes for their production are provided. The end products, 1-methyl-2-isopropyl-5-nitroimidazole, 1-methyl-2-(1-methyl-1-methoxyethyl)-5-nitroimidazole and 1-methyl-2-(1-methyl - 1 - hydroxyethyl)-5-nitroimidazole, are useful in the treatment of protozoal and bacterial infections.

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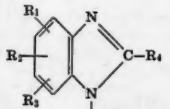
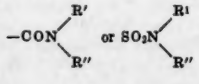
**3,652,580**
**BENZIMIDAZOLE COMPOUNDS AND PESTICIDAL PREPARATIONS CONTAINING THEM**
**Stefan Janiak, Basel, and Otto Rohr, Therwil, Switzerland, assignors to Ciba Limited, Basel, Switzerland**
**No Drawing. Filed Oct. 22, 1968, Ser. No. 769,699**
**Claims priority, application Switzerland, Oct. 26, 1967, 15,005/67**
**Int. Cl. C07d *49/38***
**U.S. Cl. 260—309.2** **3 Claims**

The invention relates to benzimidazolyle derivatives of the general formula



wherein $R_1$, $R_2$ and $R_3$ may be identical or different and each represents hydrogen, halogen, alkyl, alkoxy, alkylthio, alkylSO—, alkylSO$_2$—, —NO$_2$, —CN, $CF_3$, CHO, COOR',



wherein R' and R'' each represents hydrogen or lower alkyl and $R_4$ represents hydrogen or an aliphatic or cycloaliphatic residue, X=O, S, —NH— or N-alkyl and $R_5$ represents an aliphatic, araliphatic or aromatic residue.

These new compounds are very effective as ingredients in bicidal preparations for plant-protection and combating insects, acarides, nematodes, endoparasites and microbes.

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**3,652,581**
**PRODUCTION OF SUBSTITUTED IMIDAZOLES**
**Hermann Spaenig, Limburgerhof, and Anna Steimmig and Jakob Sand, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany**
**No Drawing. Filed Dec. 16, 1968, Ser. No. 784,237**
**Claims priority, application Germany, Dec. 16, 1967, P 16 70 293.5**
**Int. Cl. C07d *49/36, 49/38***
**U.S. Cl. 260—309.2** **7 Claims**

Production of imidazoles substituted on nitrogen by reacting imidazoles with aliphatic alcohols or ethers at 200–450° C. in the presence of, as catalyst, alumina, pumice or titanium oxide having at least 5% phosphoric acid deposited thereon or alumina impregnated with at least 5% of $Ca(H_2PO_4)_2$ or thorium oxide in an amount equivalent to at least 5% $Th(NO_3)_4$. The products are valuable intermediate for the production of dyes, textile auxiliaries and insecticides.

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**3,652,582**
**ADDUCT OF 5,5-DIMETHYLHYDANTOIN WITH CHLORAL HYDRATE AND ITS PREPARATION**
**Janos Csaszar, Laszlo Nizsalovszky, and Laszlo Tardos, Budapest, Hungary, assignors to Chinoin Gyogyser-Es Vegyeszeti Termekek Gyara RT, Budapest, Hungary**
**No Drawing. Filed Feb. 18, 1969, Ser. No. 800,287**
**Claims priority, application Hungary, Feb. 21, 1968, CI 782**
**Int. Cl. C07d *49/32***
**U.S. Cl. 260—309.5** **2 Claims**

An addition compound is formed by reaction of dimethylhydantoin with chloral hydrate at room temperature. The product is a hypnotic free of the side effects of chloral hydrate.

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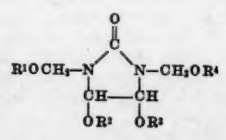
**3,652,583**
**CONDENSATES OF IMIDAZOLIDONE DERIVATIVES AND POLYALKYLENE GLYCOL USEFUL FOR IMPROVING TEXTILE MATERIALS**
**Shigeru Tajima, Ashiya-shi, Katsumi Kobayashi, Toyonaka-shi, Hiroshi Fukuhara, Osaka, Hiroki Yamamoto, Takarazuka-shi, and Shigeru Ura, Nishinomiya-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan**
**No Drawing. Filed Mar. 11, 1969, Ser. No. 806,284**
**Claims priority, application Japan, Mar. 14, 1968, 43/16,919**
**Int. Cl. C07d *49/34***
**U.S. Cl. 260—309.7** **5 Claims**

Novel composition of matter is produced by reacting 1 mole of alkylated derivatives of 4,5-bis-hydroxy-1,3-bis-hydroxymethyl-imidazolidone-2 of the formula,



wherein $R^1$, $R^2$, $R^3$ and $R^4$ respectively represent hydrogen or alkyl having 1 to 4 carbon atoms and at least one member of $R^1$, $R^2$, $R^3$ and $R^4$ is the said alkyl, with 0.2 to 2 moles of a water-soluble polyalkylene glycol having a molecular weight of 400 to 10,000.

This composition of matter is useful for improving hydrophobic synthetic textile materials or blends of hydrophobic synthetic fibers and cellulosic fibers.

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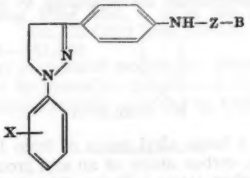
**3,652,584**

## 1,3-DI-ARYL-1,2-PYRAZOLINES AND THEIR PREPARATION

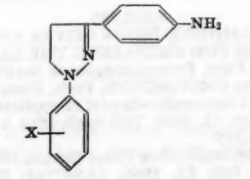
**Andre Henri Passedouet, Maisons-Lafitte, Michel G. Roussos, Lyon, and Jacqueline Pigeot and Nicole Paillole, Maisons-Lafitte, France, assignors to Societe Melle Bezons, Melle, France**

**No Drawing. Filed Feb. 16, 1968, Ser. No. 705,914**
**Claims priority, application France, Feb. 17, 1967, 95,347**
**Int. Cl. C07d** *49/10*
**U.S. Cl. 260—310** **10 Claims**

1,3-di-aryl-1,2-pyrazolines having detectable affinity for different nervous tissues to provide sedative, anti-inflammatory and/or anti-pyretic properties. The compositions are of the formula




in which X is Cl or $CF_3$; Z is a keto-alkylene group having 2 to 4 carbon atoms; B is a basic radical of the formula $NR_1R_2$, where $R_1$ is an alkyl group having 1 to 4 carbon atoms and $R_2$ is the same as $R_1$ or hydrogen, and the pharmaceutically acceptable acid addition salts thereof. The compounds are prepared by condensing a compound of the formula




with a compound of the formula C1ZB.

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**3,652,585**

## 1-(PHENYL LOWER ALKYL)-4,5,6,7-TETRAHYDROINDOLES AND METHODS OF PREPARING SAME

**William Alan Remers, Suffern, N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.**

**No Drawing. Filed Jan. 6, 1970, Ser. No. 1,042**
**Int. Cl. C07d** *27/54*
**U.S. Cl. 260—319.1** **8 Claims**

This disclosure describes compounds of the class of 1-(phenyl lower alkyl)-4,5,6,7-tetrahydroindoles useful as antibacterial, antifungal and diuretic agents.

**3,652,586**

## PROCESS FOR THE PRODUCTION OF SUBSTITUTED PHENYLACETIC ACIDS AND THEIR ESTERS

**Rolf Denss, Basel, Switzerland, Niels Clauson-Kaas, Farum, Denmark, and Franz Ostermayer, Riehen, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.**

**No Drawing. Filed Apr. 22, 1969, Ser. No. 818,401**
**Claims priority, application Switzerland, Apr. 29, 1968, 6,375/68**
**Int. Cl. C07d** *27/24*
**U.S. Cl 260—326.3** **5 Claims**

Process for the production of p-(1-pyrryl)-phenylacetic acids and their esters with analgesic and anti-inflammatory activity, comprising reacting a p-nitrosophenylacetic acid or an ester thereof with butadiene to obtain the corresponding p-(3,6-dihydro-2H-1,2-oxazin-2-yl)-phenylacetic acid or an ester thereof and subjecting said acid or ester to acidic and/or temperature conditions under which water is split off and ring contraction occurs, optionally hydrolysing the immediate reaction product either completely to form the desired acid or a salt thereof or converting it completely into a desired ester.

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**3,652,587**

## 1-(p-OXYPHENETHYL)-3-(m-OXYPHENYL) PYRROLIDINE COMPOUNDS

**Ian Moyle Lockhart, Egham, England, assignor to Parke, Davis & Company, Detroit, Mich.**

**No Drawing. Filed Aug. 25, 1969, Ser. No. 852,937**
**Claims priority, application Great Britain, Sept. 11, 1968, 43,269/68**
**Int. Cl. C07d** *27/04*
**U.S. Cl. 260—326.3** **4 Claims**

m - [1 - (p - hydroxyphenethyl) - 3 - alkyl - 3 - pyrrolidinyl]-phenols in which the 3-alkyl group contains from 2 to 5 carbon atoms inclusive; esters thereof; and salts of the foregoing compounds. These compounds are pharmacological agents. The phenols can be prepared by cleavage of the corresponding lower alkyl, benzyl, or substituted benzyl ethers. The esters can be prepared by esterification of the phenols.

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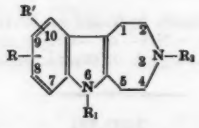
**3,652,588**

## 6-ALKYL-1,2,3,4,5,6-HEXAHYDROAZEPINO-[4,5-b]INDOLES

**Jackson B. Hester, Jr., Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.**

**No Drawing. Continuation-in-part of application Ser. No. 548,880, May 10, 1966. This application Oct. 23, 1969, Ser. No. 868,927**
**Int. Cl. C07d** *27/54, 41/08*
**U.S. Cl. 260—326.3** **9 Claims**

A 6-alkyl - 1,2,3,4,5,6 - hexahydroazepino[4,5-b]indole having a sedative tranquilizing and anorexigenic action of the formula:




wherein R and R' are selected from the group consisting of hydrogen, alkoxy and alkyl containing from 1 to 3 carbon atoms, inclusive, and halogen; wherein $R_1$ is alkyl defined as above; and wherein $R_2$ is selected from the group consisting of hydrogen, methyl, ethyl, propyl, alkanoyl groups containing 1 to 3 carbon atoms, inclusive, benzyl and benzoyl, and the organic and inorganic acid addition salts of those compounds wherein $>N—R_2$ is an amino moiety, including pharmacologically

acceptable acid addition salts of those compounds, are prepared. The compounds are used to tranquilize and sedate mammals or suppress hunger in mammals.

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3,652,589
1-(m-SUBSTITUTED PHENYL)-2-AMINOMETHYL CYCLOHEXANOLS
Kurt Flick, Bochum-Stiepel, and Ernst Frankus, Schleckheim, near Aachen, Germany, assignors to Chemie Grunenthal G.m.b.H., Stolberg, Rhineland, Germany
No Drawing. Continuation-in-part of application Ser. No. 357,024, Mar. 30, 1964. This application July 27, 1967, Ser. No. 656,314
Int. Cl. C07d 27/04
U.S. Cl. 260—326.5 M 23 Claims

This invention relates to cycloalkanol-substituted phenol ethers having a basic amine group in the cycloalkyl ring, which are useful as analgesic drugs.

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3,652,590
4-BROMO AND CHLORO-4'-TERTIARY AMINO-ALKOXY BIPHENYLS
Frederick Louis Bach, Montvale, John Claire Barclay, New York, and Elliott Cohen, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Continuation-in-part of application Ser. No. 595,359, Nov. 18, 1966, which is a continuation-in-part of application Ser. No. 427,094, Jan. 21, 1965, which in turn is a continuation-in-part of application Ser. No. 370,044, May 25, 1964. This application Jan. 12, 1968, Ser. No. 697,294
The portion of the term of the patent subsequent to Mar. 26, 1985, has been disclaimed
Int. Cl. C07d 27/04
U.S. Cl. 260—326.5 M 4 Claims

This disclosure describes compounds of the class of 4-substituted-4'-tertiary aminoethoxy biphenyls, useful as hypocholesteremic agents.

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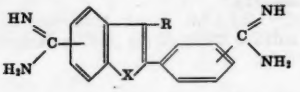
3,652,591
DIAMIDINE COMPOUNDS
Otto Dann, Bubenreuth, near Erlangen, Germany (% Farbwerke Hoechst AG, Frankfurt am Main, Germany)
No Drawing. Filed May 22, 1968, Ser. No. 731,287
Claims priority, application Germany, May 26, 1967, P 16 18 288.0
Int. Cl. C07d 27/56
U.S. Cl. 260—326.15 5 Claims

Diamidine compounds having trypanocidal action and corresponding to the general formula



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in which R represents hydrogen or lower alkyl, and X represents oxygen, —NH— or —$CH_2$—, and salts of these compounds with inorganic or organic acids.

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3,652,592
2-HALO-4-OXO-4,5,6,7-TETRAHYDROINDOLES AND METHODS OF PREPARING SAME
William Alan Remers, Suffern, N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Jan. 6, 1970, Ser. No. 1,041
Int. Cl. C07d 24/54
U.S. Cl. 260—326.16 2 Claims

This disclosure describes compounds of the class of 2-halo-4-oxo-4,5,6,7-tetrahydroindoles useful as analgesic agents.

3,652,593
OXA-THIA-BICYCLO[3.3.0]OCTADIENES
Fritz Gautschi, Sous-chez-Troppet, Commugny, Vaud, Switzerland; Bruno Willhalm, 45 ch. du Petit-Bel-Air, Chene-Bourg, Geneva, Switzerland; and George H. Buchi, 100 Memorial Drive, Cambridge, Mass. 02142
No Drawing. Filed Dec. 23, 1969, Ser. No. 887,776
Claims priority, application Switzerland, Dec. 27, 1968, 19,288/68
Int. Cl. A23l 1/22; C07d 63/18
U.S. Cl. 260—332.3 H 8 Claims

New heterocyclic compounds containing oxygen and sulphur and including 2 - methyl - 3-oxa-8-thiabicyclo-[3.3.0]1,4 - octadiene, 2 - oxa-7-thiabicyclo[3.3.0]5,8-octadiene and its 8-methyl and 6,8-dimethyl derivatives, and methods for the preparation of these compounds, and their use as flavouring agents in imitation flavours and in foodstuffs, beverages, animal feeds, pharmaceutical preparations and tobacco products.

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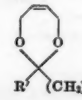
3,652,594
SUBSTITUTED 1,3-DIOXEPINS
Chester E. Pawloski, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Jan. 6, 1970, Ser. No. 1,032
Int. Cl. C07d 17/00
U.S. Cl. 260—338 9 Claims

The present invention is directed to new substituted 1,3-dioxepin compounds corresponding to the formula:



wherein R is a lower alkyl group of from 1 to about 8, both inclusive, carbon atoms or an aryl group of from 6 to about 8 carbon atoms inclusive. R' is hydrogen or an alkyl group of from 1 to about 8, both inclusive, carbon atoms, and *n* is an integer of from 0 to about 8. The present invention is further directed to a novel process for the preparation of such substituted 1,3-dioxepin compounds wherein *n* is 0 by reacting, at room temperatures, a corresponding trialkyl orthoalkanoate with cis-2-butene-1,4-diol in the presence of a non-oxidizing acid catalyst. The compounds of the present invention are suitable for use as herbicides.

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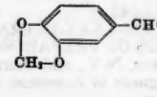
3,652,595
MANDELAMIDINE DERIVATIVES AND PROCESSES FOR PREPARING THE SAME
Louis Lafon, Paris, France, assignor to Société Anonyme dite: ORSYMONDE, Paris, France
No Drawing. Continuation-in-part of application Ser. No. 778,315, Nov. 22, 1968. This application Apr. 23, 1970, Ser. No. 31,365
Claims priority, application Great Britain, Nov. 29, 1967, 54,430/67; July 22, 1968, 34,947/68; France, Nov. 14, 1968, 173,696
Int. Cl. C07d 13/10
U.S. Cl. 260—340.5 6 Claims

This invention relates to mandelamidines of the formula:



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in which R represents a hydrogen atom, or a lower alkyl radical having not more than 3 carbon atoms, and R' represents a hydrogen atom, or an OH group or a lower alkyl radical having not more than 3 carbon atoms, their optically active isomers and their addition salts with physiologically acceptable acids. The compounds corresponding

to the above formula have activities upon the cardiovascular system and are particularly of interest for the treatment of arterial hypertension.

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3,652,596

## PRODUCTION OF UNSATURATED CARBOCYCLIC KETONES

John H. Fried, Palo Alto, Calif., assignor to Syntex Corporation, Panama, Panama

No Drawing. Continuation-in-part of applications Ser. No. 687,502, Dec. 4, 1967, and Ser. No. 747,465, July 25, 1968. This application Nov. 4, 1968, Ser. No. 773,320
Int. Cl. C07d *13/04*
U.S. Cl. 260—340.9 7 Claims

Preparation of $\alpha,\beta$-unsaturated carbocyclic ketones by reacting an enol lactone with a carbanion generated by treatment of a methylphosphonate or a mono-substituted methylphosphonate with base.

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3,652,597

## PRODUCTION OF DI-HYDROXY PRODUCTS

Henry Bader and Edwin G. Jahngen, Jr., Newton Center, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

No Drawing. Filed Mar. 2, 1970, Ser. No. 15,965
Int. Cl. C07d *7/26, 39/08*
U.S. Cl. 260—343.2 R 13 Claims

Di-hydroxy products of monohydric phenol compounds are prepared by persulfate oxidation in the presence of ethylenediaminetetraacetic acid and an olefinic free radical trap.

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3,652,598

## INTERNAL DIANHYDRIDE OF 2,2',3,3'-TETRACARBOXY BENZOPHENONE

Ronald L. Broadhead, Addison, Ill., assignor to Standard Oil Company, Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 25,548, Apr. 29, 1960. This application Oct. 8, 1963, Ser. No. 314,593
Int. Cl. C07d *1/00*
U.S. Cl. 260—346.3 1 Claim

The novel anhydrides of my invention can be represented in general by the following structural formula:

wherein R is a phenyl radical containing a carboxylic anhydride group, i.e. a group having the structural formula:

which is attached to adjacent positions on said phenyl radical. The remaining positions on said phenyl radical may be substituted with various aryl radicals; specific examples of such substituted dianhydrides are the phenyl-substituted tetracarboxylic dianhydrides, carboxyphenyl-substituted tetracarboxylic dianhydrides, naphthyl-substituted tetracarboxylic dianhydrides, carboxynaphthyl-substituted tetracarboxylic dianhydrides, benzoyl-substituted tetracarboxylic dianhydrides, carboxybenzoyl-substituted tetracarboxylic dianhydrides, and the like, wherein the dianhydride groups are in the 2,3,2',3', and 3,4,3',4' positions.



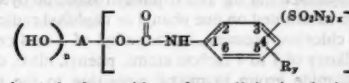
3,652,599

## NOVEL AZIDOSULFONYLCARBANILATES

Adnan A. R. Sayigh, North Haven, Benjamin W. Tucker, Bethany, and Henri Ulrich, Northford, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Mar. 20, 1970, Ser. No. 15,839
Int. Cl. C07c *117/00*
U.S. Cl. 260—349 6 Claims

Azidosulfonylcarbanilates are disclosed which are derived from aliphatic alcohols in which the hydrogen atom in one or more of the hydroxyl groups is replaced by an azidosulfonylphenylcarbamoyl group. The compounds have the formula:



wherein A is the residue of an aliphatic alcohol having $(n+m)$ hydroxyl groups and a molecular weight of less than 300, $n$ is an integer from 0 to 5, $m$ is an nteger from 1 to 6, provided that the sum of $n+m$ is not greater than 6, R is lower-alkyl or halogen, $x$ is an integer from 1 to 2, $y$ is an integer from 0 to 2, provided that the sum of $x+y$ is not greater than 3, and the $SO_2N_3$ group is in any of positions 3, 4, or 5, one of said positions being unsubstituted. The above compounds are prepared by reacting the starting aliphatic alcohol with the appropriate proportion of the appropriately substituted isocyanatobenzenesulfonyl chloride and reacting the intermediate chlorosulfonylcarbanilate with sodium azide. The above compounds are useful as crosslinkers in a wide variety of polymer systems containing C—H bonds and are activated either photolytically or thermally.

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3,652,600

## 2-FLUORO-2,2-DINITROETHYL GLYCIDYL ETHER

Vytautas Grakauskas, Arcadia, Calif., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Nov. 26, 1969, Ser. No. 880,457
Int. Cl. C07d *1/18*
U.S. Cl. 260—348 R 1 Claim

2-fluoro-2,2-dinitroethyl glycidyl ether is synthesized by reacting 2-fluoro-2,2-dinitroethanol with an epihalohydrin in the presence of sodium hydroxide and water.

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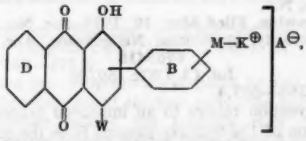
3,652,601

## ANTHRAQUINONE DYES

Berthold Gertisser, Munchenstein, Basel-Land, Switzerland, assignor to Sandoz Ltd. (also known as Sandoz A.G.), Basel, Switzerland

No Drawing. Filed Feb. 12, 1968, Ser. No. 704,528
Claims priority, application Switzerland, Feb. 20, 1967, 2,436/67; Feb. 21, 1967, 2,497/67; Feb. 23, 1967, 2,797/67; Dec. 21, 1967, 18,016/67; Jan. 18, 1968, 784/68, 785/68, 786/68
Int. Cl. C07c *1/50*
U.S. Cl. 260—380 8 Claims

Anthraquinone dyes of the formula



wherein M stands for a divalent radical, W for the nitro group or for an amino group, $K^{\oplus}$ e.g. for an ammonium-, hydrazinium- or an ammino group, $A^{\ominus}$ for an anion and wherein the ring B and/or D may be further substituted. They can be used for the dyeing of acrylonitrile polymers or copolymers.

3,652,602

## DYESTUFFS OF THE TRIPHENYLROSANILINE SERIES AND PROCESS FOR THEIR PREPARATION

Gustav Schafer, Frankfurt am Main, and Ferdinand Quint, Cratzenbach, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed July 16, 1968, Ser. No. 745,119
Claims priority, application Germany, July 22, 1967, F 53,032
Int. Cl. C09b *11/20*
U.S. Cl. 260—391 7 Claims

New asymmetrical di- and triphenylrosaniline dyestuffs which are substituted on one phenyl or naphthyl radical by fluorine, chlorine, bromine, iodine, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyl, nitro, cyano or sulfonamide group in m- or p-position to the imino group and a process for their preparation.

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3,652,603

## METHOD FOR PRODUCTION OF 2,3-DI(LOWER ALKOXY)-5-METHYL-1,4-BENZOQUINONE

Yutaka Kawamatsu and Hirosada Sugihara, Suita, Osaka, and Hiroshi Morimoto, Nishinomiya, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed June 11, 1969, Ser. No. 832,456
Claims priority, application Japan, June 11, 1968, 43/40,151
Int. Cl. C07c *49/64*
U.S. Cl. 260—396 R 10 Claims

2,3-di(lower alkoxy) - 5-methyl-1,4-benzoquinones are produced by oxidizing 3,4,5-tri(lower alkoxy) toluene with a peroxide. These materials are useful as starting materials for the synthesis of ubiquinones, the latter compounds which are medicinally important substances used in the electron transferring activity of mitochondria in living tissues.

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3,652,604

## HALOHYDRINS AND PROCESS FOR THE PREPARATION THEREOF

Rudolf Wiechert, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin, Germany

No Drawing. Filed Mar. 2, 1970, Ser. No. 15,937
Claims priority, application Germany, Mar. 7, 1969, P 19 12 794.7
Int. Cl. C07c *169/30*
U.S. Cl. 260—397.4 19 Claims

Epoxides, e.g., steroidal epoxides, are converted to the corresponding halohydrins, by reaction with lithium chloride or lithium bromide in the presence of an aliphatic carboxylic acid.

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3,652,605

## ISOMERISATION OF 17β-HYDROXY-STEROIDS

Jacobus Antonius van Gorp and Pieter Jurianus van Ree, Oss, Netherlands, assignors to Organon Inc., West Orange, N.J.

No Drawing. Filed Mar. 30, 1970, Ser. No. 24,020
Claims priority, application Netherlands, Apr. 8, 1969, 6905418
Int. Cl. C07c *169/08*
U.S. Cl. 260—397.4 4 Claims

The invention relates to an improved process for the preparation of 17α-hydroxy-steroids from the corresponding 17β-hydroxy-steroids by treating a 17-sulphonate of the latter with a mixture of an aliphatic carboxylic acid, an alkali metal salt of an aliphatic carboxylic acid and an aprotic solvent, followed by hydrolysis of the thus obtained 17α-acyloxy-compound.

3,652,606

## 3-OXYGENATED 11β-METHYLESTR-4-EN-17β-OL AND ESTERS THEREOF

John S. Baran, Morton Grove, and Ivar Laos, Skokie, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

No Drawing. Filed Aug. 7, 1970, Ser. No. 62,195
Int. Cl. C07c *169/20*
U.S. Cl. 260—397.5 2 Claims

Preparation of the captioned compounds and their valuable biological properties—including unexpectedly potent anabolic and androgenic activity—are disclosed.

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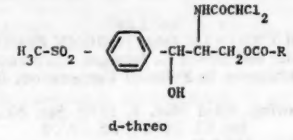
3,652,607

## THIAMPHENICOL DERIVATIVES

Uberto Maria Teotino and Davide Dellabella, Milan, Italy, assignors to Zambon S.p.A., Bresso, Milan, Italy

No Drawing. Filed May 2, 1969, Ser. No. 822,104
Claims priority, application Italy, May 11, 1968, 16,364/68
Int. Cl. C07c *143/90;* C11d *1/20*
U.S. Cl. 260—401 1 Claim

The invention provides new thiamphenicol salts comprised in the general formula:




d-threo

wherein R is an alkyl radical comprising from 13 to 17 carbon atoms. The new salts are characterized by a much more long-lasting activity than thiamphenicol alone.

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3,652,608

## PREPARATION OF UNSATURATED ESTERS

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed Sept. 20, 1968, Ser. No. 761,338
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 R 8 Claims

Hydrocarbon olefins are reacted with alkyl chloroformates in the presence of a Group VIII noble metal catalyst to yield alpha,beta-ethylenically unsaturated carboxylic acid esters and/or beta-chloro-alkanoic esters. The alkyl chloroformates may be prepared from carbon monoxide, chlorine and an alkanol under conventional conditions, thereby providing a process for the preparation of alpha,beta-ethylenically unsaturated carboxylic acid esters from an olefin and an alcohol. The by-product beta-chloro alkanoic acid esters can be pyrolyzed to obtain the complete conversion of the reactants to the more valuable ethylenically unsaturated esters which are useful as monomers for polymerization to desired products. The reaction is typified by the conversion of ethylene to alkyl acrylates and alkyl beta-chloro propionates which is performed at a temperature of about 150° C. and superatmospheric pressures in the presence of a palladium containing catalyst.

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3,652,609

## 2-PARACHLOROPHENOXY-2-METHYLPROPIONIC ACID-FATTY ACID GLYCERIDES

Harvey E. Alburn, West Chester, William Dvonch, Radnor, and Norman H. Grant, Wynnewood, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed June 24, 1969, Ser. No. 836,162
Int. Cl. A61k *27/00;* C07c *69/30, 69/76*
U.S. Cl. 260—408 6 Claims

Fatty acid glycerides of 2-phenoxy-2-methylpropionic acids are prepared which are useful in lowering blood cholesterol and triglyceride levels in warm-blooded animals.

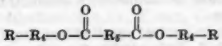
## 3,652,610
## PLASTICIZERS FROM HINDERED ACID GLYCOL MONOESTERS

Myron Coopersmith, New York, N.Y., and Gerald Rubin, Fords, and Edward Wickson, Scotch Plains, N.J., assignors to Esso Research and Engineering Company

No Drawing. Filed Nov. 22, 1966, Ser. No. 600,343
Int. Cl. C07c *69/34, 69/76;* C11c *3/04*
U.S. Cl. 260—410.6 2 Claims

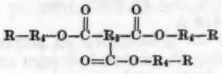
Novel esters having the generic formula:

(I)

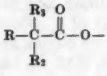


and

(II)



wherein R has the following general formula:



wherein $R_1$, $R_2$ and $R_3$ are each $C_1$–$C_{20}$ hydrocarbyl radicals, $R_4$ is selected from the group consisting of $C_2$–$C_{15}$ alkyl, aryl, cycloalkyl and alkaryl radicals, and $R_5$ is selected from the group consisting of $C_0$–$C_{15}$ alkyl, aryl, cycloalkyl and alkaryl radicals, are prepared by the reaction of a neo-acid glycol monoester with a di- or tri-basic acid or anhydrides. The novel esters formed by the above-described process are prepared in substantially pure form and find usefulness as excellent plasticizers and lubricants.

## 3,652,611
## PRODUCTION OF CARBOXYLIC ACIDS BY OXIDATION OF 1,2-EPOXIDES

Clyde E. Bishop, Indianapolis, Ind., assignor to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed Dec. 30, 1970, Ser. No. 102,990
Int. Cl. C07c *51/24*
U.S. Cl. 260—413 6 Claims

1,2-epoxides are converted to carboxylic acids by oxidizing the epoxides with nitric acid in the presence of a vanadium compound promoter at a temperature in the range of from about 0° C. to about 110° C.

## 3,652,612
## PROCESS FOR THE PREPARATION OF DIANIONS AND OF α-SUBSTITUTED CARBOXYLIC ACIDS AND THEIR DECARBOXYLATED DERIVATIVES

Philip E. Pfeffer and Leonard S. Silbert, Philadelphia, Pa., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Aug. 27, 1969, Ser. No. 853,505
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 18 Claims

A process for the preparation of dianions of straight chain saturated and unsaturated aliphatic carboxylic acids and of α-substituted carboxylic acids and their decarboxylated derivatives. The carboxylic acid is metalated with lithium diisopropylamide in the mixed solvent system tetrahydrofuran - hexane - hexamethylphosphoramide and the metalated fatty acid is reacted in the same solvent system with an electrophile to produce the desired α-substituted carboxylic acid. Decarboxylation is also effected in the same solution thus making this method essentially a one step process for any of the products.

## 3,652,613
## PROCESS FOR THE PRODUCTION OF PLATINUM COMPOUNDS

Donald Wright, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Sept. 23, 1969, Ser. No. 860,408
Claims priority, application Great Britain, Oct. 4, 1968, 47,229/68
Int. Cl. C07f *15/00*
U.S. Cl. 260—429 R 10 Claims

Platinous carboxylates, particularly platinous alkanoates such as platinous acetate, are obtained by reacting a platinic halide with a metal carboxylate, particularly a silver carboxylate, which forms a halide insoluble in the reaction medium.

## 3,652,614
## RHODIUM COMPLEXES CONTAINING TERT-PHOSPHINE LIGAND

Kenneth C. Dewhirst, New Rochelle, N.Y., and Wilhelm Keim, Alameda, and Helmut E. Thyret, Oakland, Calif., assignors to Shell Oil Corporation, New York, N.Y.

No Drawing. Original application Oct. 20, 1966, Ser. No. 587,972, now Patent No. 3,502,725, dated Mar. 24, 1970. Divided and this application Oct. 23, 1969, Ser. No. 871,328
Int. Cl. C07f *9/50*
U.S. Cl. 260—429 6 Claims

Production of aromatic 2,7-alkadienyl ethers and N-(2,7-alkadienyl)amines by reacting phenols or organic amines, wherein there is present at least one N-hydrogen substituent, with conjugated alkadienes in the presence of rhodium(I) complexes containing tertiary phosphine ligands and additionally containing hydrogen, phenoxide, acetate, alkyl, aryl or π-allyl ligands.

## 3,652,615
## PLATINUM COMPLEXES

Nicou Parasko, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

No Drawing. Original application Mar. 14, 1968, Ser. No. 712,961, now Patent No. 3,522,327, dated July 28, 1970. Divided and this application Dec. 24, 1969, Ser. No. 889,837
Claims priority, application France, Mar. 29, 1967, 100,664
Int. Cl. C07f *15/00*
U.S. Cl. 260—429 R 4 Claims

The invention provides new complexes of platinous chloride with triaminophosphines which are useful as catalysts for promoting the reaction between alkenyl groups and hydrogen attached to silicon e.g. in curable organopolysiloxane compositions.

## 3,652,616
## ADDITIVES FOR FUELS AND LUBRICANTS

Roger W. Watson, Highland, Ind., William T. Brannen, Jr., Westlake, Ohio, and Warren W. Hillstrom, Bel Air, Md., assignors to Standard Oil Company, Chicago, Ill.

No Drawing. Filed Aug. 14, 1969, Ser. No. 850,244
Int. Cl. C07f *11/00, 15/00, 7/28*
U.S. Cl. 260—429 R 8 Claims

Disclosed are compositions prepared by (a) reacting a hydrocarbon-substituted succinic anhydride and an alkylene polyamine having the formula $H_2N$ (-alkylene-$NH)_nH$, where $n$ is an integer from about 1 to about 12 and "alkylene" is a saturated divalent hydrocarbon having from about 1 to about 10 carbon atoms; and (b) reacting the material formed in step (a) with a reactant having an available metal atom capable of being sequestered. These compositions are useful as fuel and lubricant additives.

3,652,617

## VANADIUM OXYTRIALCOHOLATES

Erich Termin, Niederkassel, Otto Bleh, Bergheim, and Arnold Lenz, Cologne-Stammheim, Germany, assignors to Dynamit-Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Dec. 9, 1969, Ser. No. 883,527
Claims priority, application Germany, Dec. 21, 1968, P 18 16 386.5
Int. Cl. C07f 9/00
U.S. Cl. 260—429 R 6 Claims

Preparation of alcoholates of orthovanadic acid, called vanadium oxy esters or vanadyl esters, having the general formula:

$$VO(OR)_3$$

in which R represents alkyl or cycloalkyl radicals, especially those having 1 to 5 carbon atoms in the alkyl radical, by the reaction of vanadium pentoxide with anhydrous alcohols.

3,652,618

## PROCESS FOR PREPARING HEXAORGANODITIN COMPOUNDS

Gerald H. Reifenberg, Hightstown, and William J. Considine, Somerset, N.J., assignors to M & T Chemicals Inc., New York, N.Y.

No Drawing. Filed Nov. 4, 1968, Ser. No. 773,329
Int. Cl. C07f 7/22
U.S. Cl. 260—429.7 4 Claims

This invention is a method for preparing compounds of the formula $R_3SnSnR_3$ comprising pyrolyzing a triorganotin formate of the formula

wherein R is a hydrocarbon selected from the group consisting of alkyl, alkenyl, aralkyl, and cycloalkyl radicals, and separating $R_3SnSnR_3$.

3,652,619

## ORGANO-ZINC ALKANOLAMINE COMPLEX FOR STABILIZING VINYL HALIDE RESINS

Lawrence R. Jones, Terre Haute, Ind., assignor to Commercial Solvents Corporation

No Drawing. Filed Dec. 29, 1969, Ser. No. 888,804
Int. Cl. C07f 3/06
U.S. Cl. 260—429.9 4 Claims

Stabilized polyvinyl halide compositions including copolymers thereof, stabilized against heat degradation by incorporating therein from 1–10% by weight of a complex obtained by reacting an alkanolamine represented by the formula

where R is methyl, ethyl or hydroxymethyl with zinc glutamate or zinc sulfate.

3,652,620

## α,β-UNSATURATED OXIME COMPLEXES OF NICKEL NITROSYL HALIDES AND THEIR PREPARATION

Robert A. Clement, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Oct. 23, 1970, Ser. No. 83,639
Int. Cl. C07f 15/04; C07c 3/10
U.S. Cl. 260—439 R 9 Claims

Novel complexes of nickel nitrosyl halides with α,β-unsaturated oximes, e.g., nickel nitrosyl bromide-acrolein oxime complex, are prepared by reacting nitric oxide with (1) a π-allyl nickel halide or (2) an allylic halide and nickel tetracarbonyl. The new complexes are useful precursors of known complexes, e.g., triphenylphosphine (nitrosyl)bromonickel, a known catalyst for the oligomerization of olefins.

3,652,621

## CONTINUOUS PRODUCTION OF ORGANO-ALUMINUM COMPOUND

Eiichi Ichiki, Kazuo Iida, and Aturo Matui, Niihama, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Continuation-in-part of application Ser. No. 680,321, Nov. 3, 1967. This application May 21, 1970, Ser. No. 39,211
Int. Cl. C07f 5/06
U.S. Cl. 260—448 A 7 Claims

In a process for synthesizing an alkylaluminum compound by reacting aluminum, hydrogen and an olefin, or aluminum and hydrogen in the presence of trialkylaluminum as a catalyst, the alkylaluminum compound is economically produced in a continuous manner by introducing a trialkylaluminum compound, hydrogen or an olefin to the lower part of a column-type reactor packed with aluminum cut pieces having an apparent specific surface area of not more than 60 $cm.^2/g.$ for effecting reaction and withdrawing the formed alkylaluminum compound from the upper part of the reactor.

3,652,622

## ORGANICALLY SUBSTITUTED SODIUM ALUMINUM HYDRIDES AND METHOD OF MAKING AND USING THE SAME

Jaroslav Vit, Bohuslav Casensky, and Milan Mamula, Prague, and Jiri Machacek, Rez, Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

No Drawing. Filed Nov. 10, 1966, Ser. No. 594,971
Claims priority, application Czechoslovakia, Nov. 13, 1965, 6,771/65; Mar. 26, 1966, 2,009/66, 2,010/66
Int. Cl. C01b 6/28; C07f 5/06
U.S. Cl. 260—448 AD 10 Claims

1. A substituted sodium aluminum hydride of the formula $NaAlH_xQ_{4-x}$, wherein $x$ is 1 or 2 and wherein Q is an organic residue derived by splitting off an active hydrogen atom from a compound selected from the ground consisting of:

(1) ether alcohols of the formula $R'O(CH_2)_z OH$ where R' is alkyl of 1 to 4 carbon atoms and $z$ is an integer from 2 to 4;

(2) polyether alcohols of the formula

$$R'(OCH_2)_nO(CH_2)_zOH$$

wherein $n$ is an integer from 2 to 4 and R' and $z$ have the same meaning as in (1) above;

(3) an amino alcohol of the general formula

$$R''R'''N(CH_2)_zOH$$

wherein R'' and R''' are each selected from the group consisting of $RO(CH_2)_z$ and R, and wherein R is selected from the group consisting of alkyl of 1 to 4 carbon atoms and aryl of 6 to 8 carbon atoms, and wherein $z$ has same meaning as in (1) above.

3,652,623

## ORGANIC ALUMINUM COMPOUNDS

Shigeaki Washio and Shunji Araki, Befucho, Kakogawa, Japan, assignors to Taki Kasei Co., Ltd., Kakogawa, Japan

No Drawing. Filed Sept. 24, 1968, Ser. No. 762,130
Claims priority, application Japan, Sept. 30, 1967, 42/63,152, 42/63,153
Int. Cl. C07f 5/06
U.S. Cl. 260—448 AD 3 Claims

Complex organic aluminum compounds of the following empirical formula: $Al_xCl(OR)_yO_z$ wherein R is an

alkyl radical having from 1 to 8 carbon atoms; $x$, $y$, and $z$ are numbers between 1.5 and 5.0, 3.0 and 7.0 and 1.5 and 3.5, respectively, and $y+2z=3x-1$ are disclosed. The compounds have astringent-antiperspirant properties.

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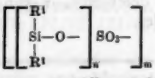
**3,652,624**

## EQUILIBRATED POLYDIORGANOSILOXANYL-SULFATE MIXTURES AND PROCESS FOR THEIR PREPARATION

**Gerd Rossmy, Essen-Werden, Germany, assignor to Th. Goldschmidt A.G., Essen, Germany**

**No Drawing. Filed Jan. 28, 1970, Ser. No. 6,549**
**Int. Cl. C07f 7/02**
**U.S. Cl. 260—448.2 N** **46 Claims**

Equilibrated polydiorganosiloxanylsulfate mixtures of the formula



wherein $R^1$ is the same or different in the molecule or molecule mixture and stands for methyl or ethyl; $n$ has a value of from 2 to 20 and $m$ has a value of from 1 to 2. The novel mixtures are useful as water repellents.

The application also discloses procedures for preparing such mixtures.

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**3,652,625**

## PROCESS FOR THE PREPARATION OF BIS(TRIORGANOSILYL)ACETYLENE

**Georges Bakassian, Caluire, and André Bazouin, Luzinay, France, assignors to Rhone-Poulenc S.A., Paris, France**

**No Drawing. Filed Feb. 1, 1971, Ser. No. 111,762**
**Claims priority, application France, Feb. 2, 1970, 7003549**
**Int. Cl. C07f 7/08**
**U.S. Cl. 260—448.2 E** **10 Claims**

Bis-trihydrocarbylsilyl acetylenes are obtained by reacting tetrachloroethylene and a trihydrocarbyl-chlorosilane with zinc or magnesium in the presence of a hexaalkylphosphotriamide or an N-alkylpyrrolidone.

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**3,652,626**

## PROCESS FOR THE PREPARATION OF COMPOUNDS WITH TRIORGANOSILYLETHYNYL GROUPS

**Georges Bakassian, Caluire, and André Bazouin, Luzinay, France, assignors to Rhone-Poulenc S.A., Paris, France**

**No Drawing. Filed Feb. 12, 1971, Ser. No. 115,053**
**Claims priority, application France, Feb. 13, 1970, 7005153**
**Int. Cl. C07f 7/08**
**U.S. Cl. 260—448.2 E** **10 Claims**

Tri-hydrocarbyl-silyl acetylenes are obtained by reacting trichloroethylene and a tri-hydrocarbylchlorosilane with zinc or magnesium in the presence of a hexaalkylphosphotriamide or an N-alkyl-pyrrolidone.

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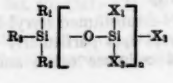
**3,652,627**

## CYANOACETIC SILICON ALCOHOL ESTERS AND METHOD FOR PREPARATION OF SAME

**Francois Meiller, Palaiseau, France, assignor to Societe Industrielle des Silicones, Paris, France**

**No Drawing. Filed June 19, 1969, Ser. No. 834,895**
**Claims priority, application France, June 21, 1968, 155,984**
**Int. Cl. C07f 7/10**
**U.S. Cl. 260—448.2 N** **10 Claims**

Cyanoacetic esters of silicon alcohols having thhe general formula



in which $R_1$, $R_2$ and $R_3$, which may be the same or different, represent an alkyl group containing from 1 to 3 carbon atoms, $X_1$, $X_2$ and $X_3$, which may be the same or different, represent an alkyl halogenoalkyl or cyanoacetoxyalkyl group in which the alkyl residue has from 1 to 3 carbon atoms, phenyl or halogenophenyl group, in which at least one of the groups is a cyanoacetoxyalkyl group and $n$ is a whole number of from 1 to 40 in which the ester is produced by reacting a mono- or polyfunctional silicon alcohol with cyanoacetic acid or alkyl cyanoacetate or with cyanoacetic acid and a hexaalkyldisiloxane. The novel compounds are useful as hydraulic-fluids, lubricants, and coatings for glass fibers.

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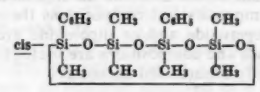
**3,652,628**

## CYCLOTETRASILOXANES WHICH IMPART ALTERATION OF GENITAL FUNCTION IN MAMMALS

**James Franklin Hyde and David E. Spielvogel, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**No Drawing. Filed July 7, 1969, Ser. No. 839,696**
**Int. Cl. C07f 7/08, 7/20**
**U.S. Cl. 260—448.2 R** **1 Claim**

Certain phenyl and methyl containing cyclotetrasiloxane compounds which exhibit androgen depressant effects. For example, by orally administering a cyclotetrasiloxane of the formula



it has been shown that one can alter the genital function (which includes reproductive capacity as well as androgenic and estrogenic capacity) of mammals.

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**3,652,629**

## NITROGEN CONTAINING POLYMERS

**Godfrey Fort, Ardrossan, Scotland, assignor to Imperial Chemical Industries Limited, London, England**

**No Drawing. Filed Dec. 16, 1969, Ser. No. 885,637**
**Claims priority, application Great Britain, Dec. 30, 1968, 61,661/68**
**Int. Cl. C07f 7/02**
**U.S. Cl. 260—448.2 N** **14 Claims**

Siloxane-oxyalkylene copolymers containing one or more units having an oxyalkylene block connected to a silicon atom through an N-alkylene carbamyloxy group. The compounds are useful as emulsifiers, dispersing agents, lubricants for fibres and plastics, nonionic surface active agents and latex coagulants.

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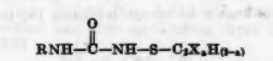
**3,652,630**

## N-POLYHALOVINYLTHIO UREAS

**Melancthon S. Brown, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**No Drawing. Filed Jan. 7, 1969, Ser. No. 789,596**
**Int. Cl. C07c 119/00**
**U.S. Cl. 260—453 R** **5 Claims**

Ureas of the formula



in which R is hydrogen, hydrocarbyl radicals of 1 to 15 carbon atoms which are free of aliphatic unsaturation and

have 0 to 3 halogen substituents, X is Cl or Br and *a* is 2 or 3 the $—S—C_2X_aH_{(3-a)}$ group indicating a polyhalovinylthio group. These ureas are biologically active against fungi and aquatic weeds.

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3,652,631

## O,O'-DIOL BISPEROXYCARBONATES

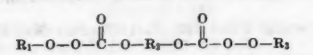
**Henry C. Stevens, Akron, and Hans J. Wartmann, Wadsworth, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**No Drawing. Continuation of application Ser. No. 458,449, May 24, 1965. This application Nov. 19, 1969, Ser. No. 871,691**

**Int. Cl. C07c** *3/10;* **C08f** *1/60*

**U.S. Cl. 260—453 R** **7 Claims**

Described are diesters of diols of poly(oxyalkylene) diols and two acid peroxyesters of a monohydric alcohol and carbonic acid wherein the carbonyl groups of the peroxyesters are esterified with the diol. These compounds are represented by the structure



$R_1$ and $R_3$ are organic radicals having up to 10 carbon atoms and $R_2$ is the divalent radical of a diol.

Method of their preparations involve reaction of a bischloroformate of the diol with an organic hydroperoxide. These compounds and compositions thereof with an organic hydroperoxide and/or diperoxide are described. The compounds and compositions are useful for polymerizing olefinically unsaturated monomers.

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3,652,632

## ORGANIC SULFUR COMPOUNDS AND METHOD OF PRODUCTION THEREOF

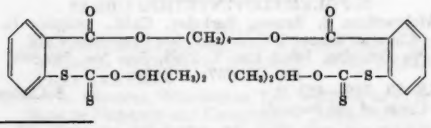
**Lubomir C. Vacek, Toledo, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio**

**No Drawing. Continuation-in-part of applications Ser. No. 477,011, Aug. 3, 1965, and Ser. No. 601,327, Dec. 13, 1966, the latter being a continuation-in-part of applications Ser. No. 477,030, Aug. 3, 1965, and Ser. No. 373,092, June 5, 1964. This application Nov. 6, 1968, Ser. No. 773,958**

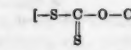
**Int. Cl. C07c** *154/00, 154/02, 113/04*

**U.S. Cl. 260—455 B** **20 Claims**

The invention provides new organic sulfur compounds which are organic xanthates, alkylenedixanthates, di- and trithiocarbonates and dixanthate esters which are useful as fungicides and as chemical intermediates, and a method for the production thereof. Examples of such compounds are o-methoxycarbonylphenyl ethylxanthate, bis-(o-methoxycarbonylphenyl) ethylenedixanthate, S,S-bis-(o-methoxycarbonylphenyl) dithiocarbonate, bis(o-methoxycarbonylphenyl) trithiocarbonate and 1,4-butanediol bis[(o-isopropoxy thiocarbonyl mercapto) [1] benzoate], i.e., a compound having the formula



[1] So far as is known no recognized name for the moiety



has been established, the above-suggested name uses "o-isopropoxy thiocarbonyl mercapto" for the moiety.

3,652,633

## PRODUCTION OF PHOSPHORUS SULFITOBETAINES

**Harry Distler, Ludwigshafen, and Rudi Widder, Eppelheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany**

**No Drawing. Filed Aug. 4, 1969, Ser. No. 847,434**

**Claims priority, application Germany, Aug. 13, 1968, P 17 93 184.9**

**Int. Cl. C07c** *137/00*

**U.S. Cl. 260—456 R** **10 Claims**

Production of phosphorus sulfitobetaines by reaction of tertiary phosphines with 1,2-glycol sulfites. The products are catalysts for the oxyalkylation of saturated or unsaturated carboxylic acids and starting materials for the production of dyes, detergents, wetting agents, finishing agents and pesticides.

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3,652,634

## PROCESS FOR PREPARING A [(2-BENZOYL-PHENYLCARBAMOYL)METHYL]-HYDROXY CARBAMIC ACID, ETHYL ESTER, ETHYL CARBONATE

**Stanley C. Bell, Philadelphia, Pa., assignor to American Home Products Corporation, New York, N.Y.**

**Original application Feb. 18, 1966, Ser. No. 528,623, now Patent No. 3,489,747, dated Jan. 13, 1970. Divided and this application June 23, 1969, Ser. No. 852,135**

**Int. Cl. C07c** *125/06*

**U.S. Cl. 260—463** **2 Claims**

2-amino-phenylbenzylideneaminoacetic acid N-oxides are reacted with ethyl chloroformate to produce the corresponding [(2 - benzoylphenylcarbamoyl)methyl]hydroxycarbamic acid, ethyl ester, ethyl carbonate. The products are intermediates in the preparation of 1,4-benzodiazepine compounds which have central nervous system activity.

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3,652,635

## STABILIZED α-CYANOACRYLATE ADHESIVE COMPOSITIONS

**Sukeyoshi Kawamura, Kishichiro Kondo, Kenji Ito, Hiroshi Suzuki, and Eizo Yasui, Minato-ku, and Toshiro Kobayashi, Takaoka-shi, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan**

**No Drawing. Filed July 28, 1969, Ser. No. 845,528**

**Claims priority, application Japan, Aug. 9, 1968, 43/56,118; Jan. 16, 1969, 44/2,617**

**Int. Cl. C07c** *121/00, 121/40, 121/60*

**U.S. Cl. 260—464** **7 Claims**

An adhesive composition containing an aromatic sulfonic acid as a stabilizer. This composition can be increased in tackiness, without causing length, by addition of an acrylate ester-acrylonitrile copolymer.

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3,652,636

## NITRILE CONTAINING STYRYL DYES

**Horst Scheuermann and Matthias Seefelder, Ludwigshafen (Rhine), Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany**

**No Drawing. Filed Aug. 13, 1968, Ser. No. 752,142**

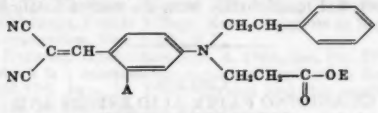
**Claims priority, application Germany, Aug. 19, 1967, P 15 69 674.9**

**Int. Cl. C07c** *121/72*

**U.S. Cl. 260—465 D** **3 Claims**

A class of p-N-N-disubstituted styryl compounds which are methine or styryl dyes particularly useful for dyeing textile material of cellulose esters and synthetic poly-

amides or polyesters fast green-yellow shades. Particularly useful styryl dyes are those of the formula



wherein A is hydrogen or methyl and E is methyl, ethyl, n-butyl or isobutyl.

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3,652,637

## VAPOR PHASE SYNTHESIS OF CHLORINATED AROMATIC NITRILES

Russell M. Bimber, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Nov. 22, 1968, Ser. No. 778,091
Int. Cl. C07c *121/02, 121/62, 121/64*
U.S. Cl. 260—465 G 7 Claims

An all-vapor phase process for the synthesis of chlorinated aromatic nitriles and chlorinated heteroaromatic nitriles involves reacting substituted aromatic and heteroaromatic compounds with ammonia and a source of oxygen under ammoxidation conditions followed by reacting the ammoxidation product while in the vapor phase with chlorine under chlorination conditions with subsequent condensation of the synthesized product to the solid state.

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3,652,638

## NITRILE PRODUCTION

Herbert Riegel, Maplewood, N.J., Harvey D. Schindler, New York, N.Y., and Morgan C. Sze, Upper Montclair, N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Dec. 9, 1968, Ser. No. 782,020
Int. Cl. C07c *121/02*
U.S. Cl. 260—465.3 28 Claims

Process for producing nitriles by contacting a hydrocarbon containing feed, such as an alkane, alkene or alkyl-substituted aromatic hydrocarbon, with ammonia and either oxygen and a melt containing a multivalent metal halide in both its higher and lower valence state, such as a mixture of copper chlorides; or a melt containing a multivalent metal halide in both its higher and lower valence state and the corresponding metal oxyhalide in the absence or presence of oxygen.

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3,652,639

## GRAFT COPOLYMERS OF ACRYLONITRILE ON UNSATURATED POLYOLS

Louis C. Pizzini, Trenton, John G. Demou, Lincoln Park, and John T. Patton, Jr., and William W. Levis, Jr., Wyandotte, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Filed Nov. 20, 1969, Ser. No. 878,594
Int. Cl. C08f *21/00, 25/00*
U.S. Cl. 260—465.4 9 Claims

Graft copolymers are prepared by the in situ polymerization of acrylonitrile in an unsaturated polyol in the presence of a free radical catalyst. The copolymers are transparent homogeneous liquids which may be employed in the preparation of flexible urethane foams having superior load bearing properties.

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3,652,640

## OXYHALOGENATED PROCESS

Francis T. Wadsworth, Trenton, and Jack Newcombe, Trenton, N.J., and Floyd T. Welch, Sulphur, La., assignors to Cities Service Company, New York, N.Y.

No Drawing. Filed July 9, 1968, Ser. No. 750,418
Int. Cl. C07c *121/30*
U.S. Cl. 260—465.7 4 Claims

Processes are described for producing α-halogenated derivatives of aliphatic compounds containing an electron withdrawing functional group, α,β-ethylenic unsaturation and at least one α-hydrogen radical by contacting the aliphatic compound with oxygen and a hydrogen halide in the presence of an oxyhalogenation catalyst. Illustrations show the production of high yields of α-chloro-acrylonitrile by passing a mixture of acrylonitrile, air and hydrogen chloride through a heated bed of a supported copper oxychlorination catalyst.

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3,652,641

## HYDROCYANATION OF OLEFINS

Joe Douglas Druliner, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Aug. 4, 1969, Ser. No. 847,400
Int. Cl. C07c *121/04*
U.S. Cl. 260—465.8 10 Claims

A process for the hydrocyanation of non-conjugated ethylenically unsaturated organic compounds using certain nickel complexes, such as a tetrakis (triaryl phosphite) nickel (0), as catalyst and a boron compound selected from the class consisting of $B(OR')_3$ where R' is an alkyl or aryl group of up to 7 carbon atoms, and $nB(OH)_3—xH_2O$ where $n$ is 1 or 2 and $x$ is from 0 to 3.

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3,652,642

## CONTINUOUS PROCESS FOR THE PREPARATION OF 2-METHYLENE GLUTARONITRILE

Theodore B. Baba, Hillsdale, N.J., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Aug. 22, 1969, Ser. No. 852,288
Int. Cl. C07c *121/20*
U.S. Cl. 260—465.8 D 12 Claims

A continuous process for the preparation of 2-methylene glutaronitrile by dimerizing, in a cascading series of reaction stages, acrylonitrile dissolved in a solvent comprising an alkanol and an aromatic hydrocarbon in the presence of a tertiary phosphine containing at least one cycloalkyl group. The preferred solvent is a mixture of tertiary butanol and benzene. The preferred catalyst is tricyclohexyl phosphine. The 2-methylene glutaronitrile is separated from the reactor effluent from the series of reactor stages by stripping out the lower boiling acrylonitrile and solvents and then distilling off the 2-methylene glutaronitrile from the higher boiling residue.

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3,652,643

## METHYL 3,3-DICHLORO-1-LOWER ALKOXY-2-OXO CYCLOPENTANE CARBOXYLATE

Charles M. Leir, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Filed Apr. 28, 1969, Ser. No. 820,013
Int. Cl. C07c *69/74, 49/36*
U.S. Cl. 260—468 R 6 Claims

Preparation of 2-hydroxy-3-lower alkyl-cyclopent-2-en-1-one via cyclizing dialkyladipate to 2-carboalkoxycyclopentan-1-one, 2-alkylation thereof to obtain 2-lower alkyl-2-carboalkoxycyclopentan-1-one, chlorination thereof to the corresponding 5,5-dichloro compound, a new compound, and acid hydrolysis to desired product, said product being used as a flavor enhancing agent.

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3,652,644

## QUATERNARY AMMONIUM SALTS OF ESTERS OF SALICYLIC ACID AS RUST INHIBITORS

Elizabeth L. Fareri, Pittsburgh, Robert J. McGuire, Monroeville, and Harold O. Strange, Penn Hills Township, Allegheny County, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Original application Aug. 2, 1965, Ser. No. 476,717, now Patent No. 3,433,607, dated Mar. 18, 1969. Divided and this application Apr. 1, 1968, Ser. No. 717,971
Int. Cl. C07c *101/42*
U.S. Cl. 260—471 R 4 Claims

Quaternary ammonium salts of esters of salicylic acid are used as rust inhibitors in hydrocarbon oil.

3,652,645
## HALOPHENOXY BENZOIC ACID HERBICIDES
Robert J. Theissen, Westfield, N.J., assignor to Mobil Oil Corporation
No Drawing. Filed Apr. 25, 1969, Ser. No. 819,412
Int. Cl. C07c 79/46
U.S. Cl. 260—471 R 5 Claims

2-nitro-5-(halophenoxy)benzoic acids and esters, salts, amides, and acyl halides thereof comprise a class of compounds that are highly effective pre- and post-emergence herbicides.

3,652,646
## CARBOXYLIC ACID DERIVATIVES
Thomas Leigh, Jeffrey Meyrick Thorp, and Wilson Shaw Waring, Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Mar. 15, 1967, Ser. No. 623,230
Claims priority, application Great Britain, Mar. 31, 1966, 14,264/66, 14,265/66
Int. Cl. C07c 65/00, 69/76
U.S. Cl. 260—473 G 8 Claims

Biphenylyloxy- and biphenylylthio-alkanoic acid derivatives which lower the concentration of cholesterol and/or triglycerides in the blood serum and reduce the level of fibrinogen in blood plasma, and which possess anti-inflammatory activity. Pharmaceutical compositions containing such compounds and a method of using such compounds in the treatment of coronary artery disease and atherosclerosis.

3,652,647
## ESTERIFICATION OF CARBOXYLIC ACIDS WITH EPOXIDES USING A CARBON CATALYST
Edward G. Zey, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 869,326, Oct. 24, 1969. This application Aug. 3, 1970, Ser. No. 60,719
Int. Cl. C07c 69/54, 69/82
U.S. Cl. 260—475 P 22 Claims

Process for the production of β-hydroxyalkyl esters of carboxylic acids by reacting the carboxylic acid with an alkylene monoepoxide utilizing a catalyst which is finely-divided carbon. Specific useful embodiments include the production of bis-(β-hydroxyethyl)terephthalate and the β-hydroxyethyl esters of acrylic and methacrylic acids.

3,652,648
## PRODUCTION OF 4,5-BENZTROPONE-2,7-DICARBOXYLIC ESTERS
Baldur Foehlisch, Stuttgart, Germany, assignor to Badische Anilin- & Soda-Fabric Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed Apr. 15, 1970, Ser. No. 28,957
Claims priority, application Germany, Apr. 21, 1969, P 19 20 081.8
Int. Cl. C07c 69/76
U.S. Cl. 260—475 FR 7 Claims

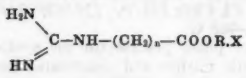
Production of benztropone dicarboxylic esters by condensation of o-phthalaldehydes with acetone dicarboxylic esters in an acid medium.

3,652,649
## PURIFICATION OF BIS-BETA-HYDROXYETHYL TEREPHTHALATE
Charles Woo and Roger M. Butler, Sarnia, Ontario, Canada, assignors to Esso Research and Engineering Company
No Drawing. Filed June 5, 1967, Ser. No. 643,387
Int. Cl. C07c 69/82
U.S. Cl. 260—475 PR 4 Claims

Crude bis-beta-hydroxyethyl terephthalate, useful in the preparation of fibers and films, is purified by dissolving the ester in a solvent, with or without the presence of minor amounts of an organic acid, contacting the solution with an adsorbent and crystallizing purified bis-beta-hydroxyethyl terephthalate from the treated solution.

3,652,650
## GUANIDINO FATTY ACID ESTERS AND THEIR PRODUCTION
Setsuro Fujii, 78, 1-chome, Kuramoto Shomachi, Tokushima, Japan
Filed Oct. 23, 1968, Ser. No. 769,815
Claims priority, application Japan, Oct. 24, 1967, 42/68,692
Int. Cl. C07c 129/12
U.S. Cl. 260—482 R 2 Claims

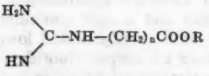
ω-Guanidino fatty acid esters of the formula



wherein $n$ is an integer of from 3 to 5 inclusive and R is an alkyl, aryl or arylalkyl group in which the aromatic may or may not be substituted.

3,652,651
## SYNTHESIS OF NOVEL GUANIDINO FATTY ACID ESTERS
Setsuro Fujii, 78, 1-chome, Kuramoto Shomachi, Tokushima, Japan
No Drawing. Filed Oct. 23, 1968, Ser. No. 770,072
Claims priority, application Japan, Oct. 24, 1967, 42/68,693
Int. Cl. C07c 101/24
U.S. Cl. 260—482 R 2 Claims

A method for producing a guanidino fatty acid ester of the formula



wherein $n$ is an integer of from 3 to 5 inclusive and R is an alkyl group of 1–7 carbon atoms, aryl or arylalkyl group in which the aromatic ring may be or may not be substituted, which comprises reacting an amino fatty acid ester of the formula:

$$H_2N(CH_2)_nCOOR$$

wherein $n$ and R are as defined above, with S-methyl thiourea or cyanamide.

3,652,652
## 3-METHALLYLLEVULINATES AND PREPARATION THEREOF
Marc Julia, Paris, France, assignor to Rhone-Poulenc S.A., Paris, France
No Drawing. Application July 1, 1966, Ser. No. 574,520, which is a division of application Ser. No. 329,242, Dec. 9, 1963. Divided and this application Apr. 22, 1969, Ser. No. 818,399
Claims priority, application France, Dec. 9, 1962, 919,497
Int. Cl. C07c 67/00, 69/66
U.S. Cl. 260—483 3 Claims

The invention provides alkyl 3-methallyllevulinates useful as intermediates in the preparation of chrysanthemic acid and a process for their production by reaction of an alkyl enol ether of an alkyl levulinate with methallyl alcohol and heating.

3,652,653

## POLYHALO DISULFIDE ALCOHOL DERIVATIVES

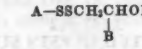
Carl D. Emerson, Kansas City, Mo., and Paul C. Aichenegg, Prairie Village, Kans., assignors to Baychem Corporation, New York, N.Y.

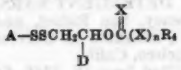
No Drawing. Application Sept. 4, 1968, Ser. No. 757,487, which is a continuation-in-part of application Ser. No. 560,125, June 24, 1966. Divided and this application Mar. 27, 1969, Ser. No. 811,190

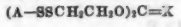
Int. Cl. C07c *69/34, 69/60*

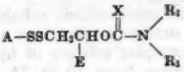
U.S. Cl. 260—485 H 14 Claims

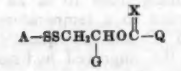
Compounds are prepared having one of the formulae

(1) 

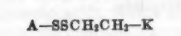
(2) 

(3) 

(4) 

(5) 

and

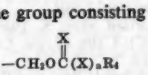
(6) 

where

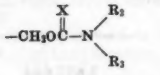
A is selected from the group consisting of di to tetrahaloethyl and di to trihalovinyl;

B is selected from the group consisting of hydrogen and —$CH_2OH$;

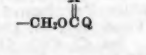
D is selected from the group consisting of hydrogen and



E is selected from the group consisting of hydrogen and



G is selected from the group consisting of hydrogen and



*n* is 0 or 1,

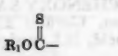
X is selected from the group consisting of oxygen and sulfur except that when *n* is 0 in formula (2) X must be oxygen;

Q is halogen;

$R_1$ is selected from the group consisting of alkyl, phenyl, lower alkyl phenyl, halo lower alkyl, halophenyl, naphthyl, lower alkyl naphthyl and lower alkyl halophenyl;

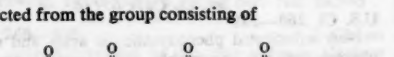
$R_2$ and $R_3$ individually are the same as $R_1$ or hydrogen with the proviso that not more than one of $R_2$ and $R_3$ is hydrogen and collectively together with the adjacent nitrogen atom form a 5 to 6 membered heterocyclic ring having up to 1 oxygen atom therein;

$R_4$ is $R_1$ or

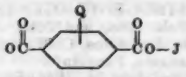


or phenyl ethylene or halophenoxymethyl having up to 3 halogens and up to 1 methyl group on the aromatic ring;

K is selected from the group consisting of



and



J is selected from the group consisting of hydrogen and $ASSCH_2CH_2$—;

*m* is an integer from 0 to 2 inclusive, and all halogen atoms in the compounds have an atomic weight of 35 to 80.

The compounds are useful as herbicides, fungicides, nematocides, defoliants and desiccants. 1,2,2-trichloroethyldithioethyl-2′-methyl-4′-chlorophenoxy acetate is a particularly effective herbicide.

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3,652,654

## STAGED OXYGEN FEED IN A CATALYTIC PROCESS FOR THE MANUFACTURE OF UNSATURATED ACIDS AND ESTERS

Kin Hsueh-Yuan Tsu, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 818,818, Apr. 23, 1969. This application May 5, 1970, Ser. No. 34,907

Int. Cl. C07c *51/24, 67/00, 69/54*

U.S. Cl. 260—486 D 7 Claims

In a process of making an unsaturated aliphatic acid or ester by catalytic dehydrogenation of a saturated aliphatic acid or ester reactant passed with oxygen through a solid catalyst reaction zone, the total oxygen for the catalytic reaction is introduced in fractions at several spaced-apart intervals along the path of the acid or ester reactant through the solid catalyst reaction zone. Such staged addition of oxygen improves the percent conversion and product selectivity for the reaction.

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3,652,655

## PREPARATION OF ESTERS OF UNSATURATED CARBOXYLIC ACIDS

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed Oct. 10, 1969, Ser. No. 865,489

Int. Cl. C07c *67/00*

U.S. Cl. 260—486 AC 16 Claims

The invention comprises the carbonylation of a hydrocarbon olefin by contacting the olefin and carbon monoxide with a carbonyl compound in the presence of a Group VIII noble metal catalyst to produce an ester of an unsaturated carboxylic acid. A typical process comprises contacting ethylene and carbon monoxide with butanal in a liquid medium containing a palladium catalyst to produce butyl acrylate, a valuable polymerization monomer.

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3,652,656

## FORMATE ESTERS

Basil Jason Heywood and Otto Meresz, Hornchurch, England, assignors to May & Baker Limited, Dagenham, Essex, England

Filed Nov. 21, 1966, Ser. No. 595,663

Claims priority, application Great Britain, Nov. 26, 1965, 50,403/65; May 17, 1966, 21,839/66

Int. Cl. C07c *67/04, 69/08*

U.S. Cl. 260—488 R 13 Claims

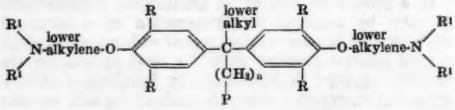
1. The diformate fraction of impirical formula $C_{11}H_{16}O_4$ obtained by the reaction of cycloocta-1,5-diene with formaldehyde or paraformaldehyde in the presence of formic acid, said fraction having a boiling point of 90–110° C./0.05 to 0.2 mm. Hg, a density of 1.1–1.2 g./ml. at 22° C., and refractive index 1.47–1.50 at 21° C. in the D line of sodium.

3,652,657
## ESTROGENIC AGENTS
John H. Fried, Palo Alto, and John A. Edwards and William McCrae, Los Altos, Calif., assignors to Syntex Corporation, Panama, Panama
No Drawing. Filed July 24, 1968, Ser. No. 747,083
Int. Cl. C07c *61/28, 61/32;* C07d *9/00*
U.S. Cl. 260—488 R 10 Claims

Novel 1,6-methano-, 1,6-dichloromethano-, 1,6-difluoromethano-, and 1,6-oxido-cyclodecapentaene alcohols, aldehydes and acids and derivatives having estrogenic activity.

3,652,658
## ESTER DERIVATIVES OF BIS[p-(AMINO-LOWER ALKYLENEOXY)PHENYL]ALKANOLS
Josef Fried, 5715 S. Kenwood Ave., Chicago, Ill. 60637; Edward Joseph Pribyl, 80 Mason Drive, Metuchen, N.J. 08840; and John Krapcho, 150 DeMott Lane, Somerset, N.J. 08873
No Drawing. Continuation-in-part of application Ser. No. 566,245, July 19, 1966, which is a continuation-in-part of application Ser. No. 288,630, June 18, 1963. This application Jan. 23, 1969, Ser. No. 793,608
Int. Cl. C07c *93/14*
U.S. Cl. 260—490 5 Claims

This application relates to acids and esters of the general formula




and to acid addition salts thereof. These substances inhibit cholesterol biosynthesis and aid in the regulation of cholesterol in the blood.

3,652,659
## METHOD FOR THE MANUFACTURE OF VINYL ESTERS
Bruno Otto Kruger and James Wilson Waites, Jr., Baton Rouge, La., assignors to Borden, Inc., New York, N.Y.
Filed Aug. 20, 1969, Ser. No. 851,568
Int. Cl. C07c *67/04*
U.S. Cl. 260—498 6 Claims

Method and apparatus for producing vinyl esters by introducing acetylene and an alkanoic acid in vapor phase into a catalyst containing reaction zone, withdrawing vaporous reaction products therefrom, and periodically changing the direction in which the vapors flow through the reaction zone. The apparatus comprises valved conduit means interconnecting the reactor with the feed and product recovery unit, said means providing a change or reversal of vapor flow in the reactor.

3,652,660
## N-HALO-N-ALKYL-o-SULFOBENZAMIDES
Frederick Edward Hardy, Newcastle-upon-Tyne, England, assignors to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Apr. 2, 1970, Ser. No. 25,292
Claims priority, application Great Britain, Apr. 25, 1969, 21,200/69
Int. Cl. C07c *143/52*
U.S. Cl. 260—507 R 7 Claims

The invention relates to novel N-halo-N-alkyl-o-sulfobenzamides. These compounds are useful in bleaching compositions and methods. Some are activators for peroxygen bleaching agents, and some have bleaching activity themselves.

3,652,661
## 9,9-BIS-AMINO ALKYL FLUORENE SULPHONIC ACIDS AND METAL SALTS THEREOF
John Ewart Lodge, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Feb. 5, 1968, Ser. No. 702,784
Int. Cl. C07c *143/56*
U.S. Cl. 260—510 6 Claims

Polyamides containing sulphofluorene links to accept basic dyestuffs (not acid) for single stage pattern dyeing.

3,652,662
## HYDROGENATED OLEFIN SULFONATE DETERGENT BARS
William A. Sweeney, San Rafael, and Gar Lok Woo, Tiburon, Calif., assignors to Chevron Research Company, San Francisco, Calif.
No Drawing. Filed June 16, 1969, Ser. No. 833,801
Int. Cl. C07c *143/02*
U.S. Cl. 260—513 R 4 Claims

Novel detergent compositions suitable for use in improved nonsoap detergent toilet bars are prepared from a solution of a complex mixture of hydrogenated olefin sulfonates containing from 10 to 24 carbon atoms by cooling the solution to a temperature in the range of from 0° C. to 35° C. and subsequently filtering the solution to recover the improved hydrogenated olefin sulfonates as the precipitate.

3,652,663
## NAPHTHENIC ACID COMPOSITIONS
Carroll J. Wedel, Walnut Creek, and John D. Gardner, Richmond, Calif., assignors to Chevron Research Company, San Francisco, Calif.
No Drawing. Filed Mar. 5, 1969, Ser. No. 804,670
Int. Cl. C10g *41/00;* C07c *61/00*
U.S. Cl. 260—514 N 6 Claims

Petroleum naphthenic acid distillate is stabilized against color degradation by the addition of salicyl anilide or hydrocarbyl phosphite.

3,652,664
## PROCESS FOR THE PRODUCTION OF AROMATIC POLYCARBOXYLATES
Donald G. Kuper, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed Nov. 20, 1969, Ser. No. 878,538
Int. Cl. C07c *51/52*
U.S. Cl. 260—515 P 6 Claims

Improved catalytic disproportionation of aromatic carboxylates to aromatic polycarboxylates containing at least one additional carboxyl group is achieved by carrying out the catalytic disproportionation process in the presence of a conventional disproportionation catalyst and at least one hydrocarboncarbonitrile adjuvant compound of the formula $R—(CN)_n$ wherein R is a hydrocarbon radical having 1–10 carbon atoms therein and *n* is 1, 2 or 3.

3,652,665
## HALO-PHENOXY SALICYLIC ACIDS
Tsung-Ying Shen, Gordon L. Walford, and Bruce E. Witzel, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.
No Drawing. Continuation-in-part of application Ser. No. 836,640, June 25, 1969. This application Apr. 20, 1970, Ser. No. 30,299
Int. Cl. C07c *65/14*
U.S. Cl. 260—520 8 Claims

New substituted phenoxysalicylic acids and non-toxic-pharmaceutically accepable salts, esters, and amides derived therefrom. The substituted phenoxysalicylic acids

disclosed herein have anti-inflammatory, anti-pyretic, and analgesic activity. Also included are methods for preparing said phenoxysalicylic acid compounds.

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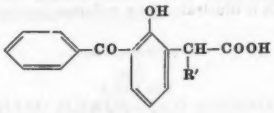
3,652,666
2-(3-BENZYL-2-METHOXY-PHENYL) ALKANOIC ACIDS
Daniel Farge, Thiais, Mayer Naoum Messer, Bievres, and Claude Moutonnier, Paris, France, assignors to Rhone-Poulenc S.A., Paris, France
No Drawing. Filed Dec. 18, 1969, Ser. No. 886,386
Claims priority, application France, Dec. 20, 1968, 179,627
Int. Cl. C07c *65/14*
U.S. Cl. 260—520 1 Claim

2-(3-benzoyl-2-hydroxyphenyl)alkanoic acids of the formula:



wherein R' is alkyl of 1 through 4 carbon atoms, which are therapeutically useful as anti-inflammatory agents, are prepared by demethylating corresponding 2-(3-benzoyl-2-methoxyphneyl)alkanoic acids, which themselves are obtained by oxidation of the methylene group of corresponding 2-(3-benzyl - 2 - methoxyphenyl)alkanoic acids to a carbonyl group.

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3,652,667
PROCESS FOR THE PREPARATION OF NAPHTHALENE-1,4-DICARBOXYLIC ACID
Hans Frischkorn and Erich Schinzel, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed Apr. 2, 1968, Ser. No. 718,240
Int. Cl. C07c *51/28, 63/02*
U.S. Cl. 260—524 M 3 Claims

Naphthalene-1,4-dicarboxylic acid is obtained by oxidation of 1-methyl-4-acetyl-naphthalene with sodium dichromate.

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3,652,668
PROCESS FOR THE OXIDATION OF HYDROCARBONS
Derek Bryce-Smith, Sonning Common, near Reading, and Stuart Samuel Adcock, Reading, England, assignors to Ethyl Corporation, New York, N.Y.
No Drawing. Filed Dec. 6, 1966, Ser. No. 599,382
Claims priority, application Great Britain, Apr. 15, 1966, 16,641/66
Int. Cl. C07c *47/54, 63/02, 69/14*
U.S. Cl. 260—524 R 11 Claims

Oxidation of non-acetylenic hydrocarbons, particularly alkyl aromatics, with molecular oxygen using a catalyst system composed of a silver substance (e.g., silver acetate) and a carboxylic acid anhydride (e.g., acetic anhydride). Small amounts of fluorine containing substances (e.g., silver fluoride) are preferably present.

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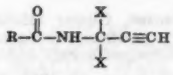
3,652,669
PREPARATION OF OXALIC ACID
Leonard Levine, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Nov. 4, 1970, Ser. No. 86,945
Int. Cl. C07c *51/24*
U.S. Cl. 260—538 8 Claims

Oxalic acid is prepared by reacting a lower alkylene oxide with concentrated nitric acid.

3,652,670
SUBSTITUTED PROPARGYL BENZAMIDES
Bruce Wayne Horrom, Waukegan, and Aldo Joseph Crovetti, Lake Forest, Ill., assignors to Abbott Laboratories, North Chicago, Ill.
No Drawing. Continuation-in-part of application Ser. No. 620,651, Mar. 6, 1967. This application Dec. 5, 1968, Ser. No. 783,779
The portion of the term of the patent subsequent to Dec. 2, 1986, has been disclaimed
Int. Cl. C07c *103/30*
U.S. Cl. 260—558 D 2 Claims

Substituted propargyl benzamides having the formula



useful as biocidal agents.

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3,652,671
PROCESS FOR MAKING A CATIONIC METHACRYLAMIDE
Benny G. Barron, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed June 1, 1970, Ser. No. 42,502
Int. Cl. C07c *103/30*
U.S. Cl. 260—561 N 10 Claims

N-(dialkylaminoalkyl)methacrylamides are prepared by thermally decomposing the corresponding N-(dialkylaminoalkyl)-2-methyl-$\beta$-alanine. The latter compound can be made by reacting methacrylic acid with an N,N-dialkylalkylenediamine. The substituted methacrylamide product is a useful cationic monomer for making flocculants, paper pulp additives, and the like.

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3,652,672
NOVEL DIIMINE COMPOUNDS
Jonathan M. Kliegman and Robert K. Barnes, Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.
No Drawing. Filed Apr. 27, 1970, Ser. No. 32,384
Int. Cl. C07c *119/00*
U.S. Cl. 260—566 R 3 Claims

A compound of the general formula:

$$RN{=}CHCH{=}NR$$

wherein R is either an i-propyl or t-butyl radical, and prepared by the reaction of an aqueous solution of glyoxal with a primary amine of the general formula:

$$RNH_2$$

wherein R is either the i-propyl or t-butyl radical. These compounds have been found to have excellent utility in inducing nonlethal physiological action on those subjected to its vapors.

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3,652,673
1,2-DI[4-(2-AMINOETHYL)PHENYL]-3-AMINOPROPANE
William J. Farrissey, Jr., Northford, and Edward J. Thompson, Watertown, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.
No Drawing. Original application Jan. 15, 1968, Ser. No. 697,652, now Patent No. 3,539,611, dated Nov. 10, 1970. Divided and this application May 8, 1970, Ser. No. 35,920
Int. Cl. C07c *87/28*
U.S. Cl. 260—570.5 P 1 Claim

A triisocyanate, 1,2 - di[4-(2-isocyanatoethyl)phenyl]-3-isocyanatopropane, is prepared by phosgenation of the

corresponding triamine. The latter is prepared by catalytic hydrogenation of the corresponding trinitrile. The latter is obtained by reaction of α,α'-dihalo-p-xylene with sodium cyanide. The triisocyanate is an intermediate in the preparation of polyurethanes; the triamine is a curative for epoxy resins and the like.

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3,652,674

## PROCESS FOR THE CATALYTIC DEHYDROGENATION OF CYCLODODECANOL AND CATALYST THEREFOR

Manfred Zur Hausen, Günter Höckele, and Wilhelm Knepper, Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

No Drawing. Filed Aug. 10, 1967, Ser. No. 659,602

Claims priority, application Germany, Aug. 12, 1966, C 39,864

The portion of the term of the patent subsequent to June 22, 1988, has been disclaimed

Int. Cl. C07c *35/02*

U.S. Cl. 260—586 A 2 Claims

Cyclododecanol is dehydrogenated in liquid phase by contacting it, at elevated temperature e.g. from about 180° C. up to the boiling point of the cyclododecanol (271° C.), with a catalyst consisting essentially of a molded and calcined mixture (calcined at 300–700° C.) of a carrier of highly dispersed silicic acid which after drying at 120° C. still has a loss on ignition of 1–10% by weight, 5–20% by weight of copper relative to the loss on ignition, up to 5% by weight of chromium and 0.5 to 15% by weight of barium ions.

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3,652,675

## 2-METHOXY-5-HYDROXYBENZALDEHYDE

Durvasula V. Rao, Hamden, and Henri Ulrich, Northford, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed June 22, 1970, Ser. No. 48,519

Int. Cl. C07c *47/56*

U.S. Cl. 260—600 1 Claim

The novel compound, 2-methoxy-5-hydroxybenzaldehyde is disclosed. This compound is distinguished from its known isomers by its capability of forming photochromic polyspirans via conversion to its O-acrylate, polymerization of the latter, demethylation of the original 2-methoxy group and condensation of the resulting poly(salicylaldehyde) derivative with 2-methylene-1,3,3-trimethylindoline. 2-methoxy-5-hydroxybenzaldehyde is obtained by selective demethylation of 2,5-dimethoxybenzaldehyde using sulfuric acid.

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3,652,676

## HYDROFORMYLATION PROCESS AND CATALYST

Gerald R. Kahle and James W. Cleary, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed July 11, 1969, Ser. No. 840,952

Int. Cl. C07c *45/02*

U.S. Cl. 260—604 HF 11 Claims

Hydroformylation reactions are carried out in the presence of a catalyst comprising a solid polymer having associated therewith a metal of the group cobalt, rhodium, ruthenium, platinum and palladium. The polymer is formed by polymerizing a pyridine and a styrene in the presence of a polyvinylaromatic compound. This polymer can be used to remove catalyst residues from hydroformylation reaction effluent streams.

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3,652,677

## POLYALKYLENEETHERS HAVING DANGLING PHOSPHONIUM GROUPS

Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, Wilmington, Del.

No Drawing. Original application Sept. 26, 1966, Ser. No. 581,771, now Patent No. 3,571,514, dated Mar. 30, 1971. Divided and this application Apr. 22, 1970, Ser. No. 30,955

Int. Cl. C07f *9/54*; B44d *1/42*

U.S. Cl. 260—606.5 F 8 Claims

Polyalkyleneethers having dangling phosphonium groups. This is illustrated by a polymer having the following unit

where OA is an oxirane-derived moiety, R is a substituted group, preferably hydrocarbon, for example alkyl, aryl, cycloalkyl, alkaryl, aralkyl, etc. Also included are copolymers of the above basic unit, such as with other oxirane units, for example copolymers with ethylene oxide, propylene oxide, butylene oxide, styrene oxide, etc. These compounds are used in inhibiting the corrosion of metals and particularly in preventing corrosion of metals, particularly iron, steel and ferrous alloys.

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3,652,678

## PROCESS FOR PREPARING PHOSPHOROUS CONTAINING POLYMERS

Keith George Allum, Bagshot, Ronald David Hancock, Thames Ditton, and Peter John Robinson, Twickenham, England, assignors to The British Petroleum Company Limited, London, England

No Drawing. Filed Sept. 25, 1969, Ser. No. 861,177

Claims priority, application Great Britain, Sept. 30, 1968, 46,215/68

Int. Cl. C07f *9/03, 15/00*; B01b *11/12*

U.S. Cl. 260—606.5 P 6 Claims

Polymers useful as catalyst support materials and containing phosphine groups are prepared by reacting a metal phosphide with a halogen-containing polymer in an inert solvent. Typical halogen-containing polymers are chloromethylated polystyrene, brominated polybutadiene, polyvinyl chloride, polychloroprene and poly(parabromostyrene). The metal phosphide can be an alkali metal phosphide e.g. potassium diphenyl phosphide.

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3,652,679

## PHENOLIC PROCESS FOR PRODUCING SULFIDES

Edward F. Zaweski, Pleasant Ridge, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed July 7, 1969, Ser. No. 839,715

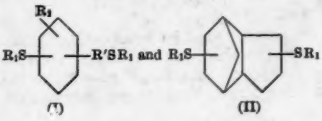
Int. Cl. C07c *149/36*

U.S. Cl. 260—609 F 10 Claims

A process for making α,α'-thiobiscresols by reacting α-alkoxycresols with alkali metal or alkaline earth metal sulfides. For example, the reaction of α-methoxy-2,6-di-tert-butyl-p-cresol with sodium sulfide yields α,α'-thiobis (2,6-di-tert-butyl-p-cresol). The products are useful antioxidants.

3,652,680
## CYCLOALIPHATIC SULFIDES
Bernard Buchholz, Blue Bell, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.
No Drawing. Filed Aug. 8, 1969, Ser. No. 848,737
Int. Cl. C07c *149/30*
U.S. Cl. 260—609 E 16 Claims

Cycloalkane bis(alkylsulfide) compounds of structure



where $R_1$ is higher alkyl, $R_2$ is H or lower alkyl and R' is lower alkylene and the use of these compounds in polyolefins as antioxidant-synergists.

3,652,681
## ALPHA-HALO SUBSTITUTED ASYMMETRICAL DIACYL PEROXIDES
Donald W. Wood, San Pablo, Calif., assignor to Argus Chemical Corporation, Brooklyn, N.Y.
No Drawing. Filed Oct. 16, 1967, Ser. No. 675,360
Int. Cl. C07c *73/02*
U.S. Cl. 260—610 D 4 Claims

Asymmetrical diacyl and aroyl-acyl organic peroxide polymerization initiators characterized by the presence of an acyclic acyl group of four or more carbon atoms in which the alpha carbon atom is substituted with one or more bromine and/or chlorine atoms.

3,652,682
## PROCESS FOR THE PREPARATION OF ALKYL, PERFLUOROALKYL AND ARYL IODIDES
Leonard S. Silbert, Philadelphia, Pa., assignor to the United States of America as represented by the Secretary of Agriculture
No Drawing. Original application Feb. 28, 1968, Ser. No. 708,804, now Patent No. 3,531,535, dated Sept. 29, 1970. Divided and this application Mar. 23, 1970, Ser. No. 24,923
Int. Cl. C07c *25/04, 76/12*
U.S. Cl. 260—612 D 7 Claims

High yields of alkyl, perfluoroalkyl and aryl iodides are prepared directly from their corresponding carboxylic acids by reaction in solution with iodine and aroyl peroxide or t-butylperoxy isopropyl carbonate. The reaction is conducted at a temperature of about 110–125° C. for about two to three hours in solvents such as 1,3-dichloropropane, 1,3-dibromopropane and 1,1,2,2-tetrachlorodifluorethane. Solvents such as 1,2-dichloroethane and carbon tetrachloride can be used as solvents but they require longer reaction times.

3,652,683
## 2-(1-HALOETHYL)-6-METHOXYNAPHTHALENES
Ian T. Harrison, Palo Alto, Calif., assignor to Syntex Corporation, Panama, Panama
No Drawing. Filed Sept. 30, 1969, Ser. No. 862,473
Int. Cl. C07c *43/20*
U.S. Cl. 260—612 D 2 Claims

2-(6-methoxy-2-naphthyl)propionic acid is prepared by reacting a 2-(1-haloethyl)-6-methoxynaphthalene with nickel carbonyl in a lower t-alkanol solvent in the presence of an alkali metal t-alkoxide until a t-alkyl 2-(6-methoxy-2-naphthyl)propionate is formed, and hydrolyzing the ester group thereof. The product has anti-inflammatory, analgesic and anti-pyretic activities.

3,652,684
## PREPARATION OF ALCOHOLS
Louis Schmerling, Riverside, and Robert A. Dombro, Chicago, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Continuation-in-part of application Ser. No. 668,693, Sept. 18, 1967. This application May 4, 1970, Ser No. 34,554
Int. Cl. C07c *35/02, 35/08*
U.S. Cl. 260—617 R 9 Claims

A primary, secondary, or tertiary alcohol may be prepared by the hydrolysis of a cycloalkanesulfonic acid or salt thereof at elevated temperatures using an alcoholic alkali medium.

3,652,685
## PROCESS FOR CATALYST REMOVAL FROM REACTION MASS
James C. Geddes, Jr., Orangeburg, S.C., assignor to Ethyl Corporation, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 188,939, Apr. 20, 1962. This application Feb. 27, 1969, Ser. No. 804,373
Int. Cl. C07c *39/06*
U.S. Cl. 260—624 C 7 Claims

A process for removal of aluminum alcoholate catalyst from reaction mass produced in ortho-alkylation of phenolic compounds which comprises adding thereto, preferably, from about 3 to about 6 mols of water per mol of aluminum-containing catalyst in the reaction mass. Process applicable to orthoalkylation of mono- or poly-nuclear and mono- or poly-hydroxy phenolic compounds and may or may not have other substituents on the ring. Addition of water is critical to efficient removal of catalyst from reaction mass.

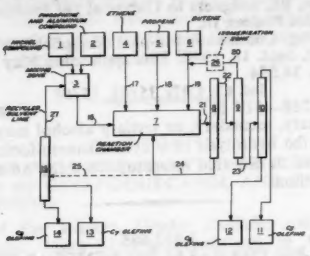
3,652,686
## PROCESS FOR THE SYNTHESIS OF 2-FLUORO-2,2-DINITROETHANOL
George W. Nauflett and Robert E. Farncomb, Oxon Hill, Md., assignors to the United States of America as represented by the Secretary of the Navy
No Drawing. Filed Oct. 1, 1969, Ser. No. 866,070
Int. Cl. C07c *31/34*
U.S. Cl. 260—633 5 Claims

Process for the preparation of 2-fluoro-2,2-dinitroethanol which involves the reaction of nitromethane and formaldehyde in the presence of a base, nitrating the product thereof by the action of tetranitromethane to form 2,2-dinitrol-1,3-propanediol, contacting the 2,2-dinitrol-1,3-propanediol with an alkali metal base and fluorinating the product thereof.

3,652,687
## PROCESS FOR THE PRODUCTION OF $C_5$–$C_8$ OLEFINES
Normann Bergem, Oslo, Ulf Blindheim, Skedsmokorset, Olav-Torgeir Onsager, Baerum, and Hagbarth Wang, Oslo, Norway, assignors to Sentralinstitutt for Industriell Forskning, Oslo, Norway
Filed July 9, 1968, Ser. No. 743,435
Claims priority, application Norway, July 17, 1967, 169,072
Int. Cl. C07c *3/10*
U.S. Cl. 260—683.15 D 3 Claims

Process for the production of $C_5$–$C_8$-olefins by the catalytic codimerization of a mixture of ethene and optionally propene in the presence of a catalyst system containing (a) a nickel haloacetate, (b) an aluminum alkyl halide and (c) a Lewis base selected from the group consisting of alkyl and cycloalkyl phosphines in a reaction zone with a butene concentration equal to or higher than the butene concentration at which the conversion of butene to higher olefins takes place at the same rate as the formation of butenes by dimerization of the ethene in the reaction zone,

separating normal butenes from the resultant olefin mixture, recycling the thus-produced normal butenes from the



reaction zone and recovering the $C_5$ to $C_8$-olefin reaction product.

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3,652,688

## HALOGENATION OF UNSATURATED HYDROCARBONS

Jerome Robert Olechowski, Trenton, and Ralph Levine, Freehold, N.J., assignors to Cities Service Company

No Drawing. Filed Dec. 30, 1968, Ser. No. 788,041
Int. Cl. C07c *17/02, 23/02*
U.S. Cl. 260—648 R 9 Claims

Processes are described for the reaction of multi-unsaturated aliphatic or cycloaliphatic hydrocarbons with elemental halogen to produce predominantly halohydrocarbon addition products. Increased yields of such fully halogenated addition products are obtained by conducting the halogenation in the presence of a halohydrocarbyl ether or ester solvent and up to about 10 moles per mole of said ether or ester of a liquid halogen free polar organic solvent. Working examples show the preparation of high purity bromoalkanes; e.g. tetra bromocyclooctane from cyclooctadiene and hexabromocyclododecane from cyclododecatriene. These high bromine content saturated products are useful as flame retardants for thermo plastic polymers.

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3,652,689

## PROCESS FOR SEPARATING MONO-CHLOROMETHYLATION AND DI-CHLOROMETHYLATION PRODUCT OF A $C_{10}$ OR LOWER AROMATIC HYDROCARBON

Harry E. Cier and Hulen L. Wilder, Baytown, Tex., assignors to Esso Research and Engineering Company

Filed May 2, 1968, Ser. No. 726,053
Int. Cl. C07c *25/14*
U.S. Cl. 200—651 R 6 Claims

A process for separating the mono-chloromethylation from the di-chloromethylation products of aromatic hydrocarbons of $C_{10}$ or lower whose mono-chloromethylation products have a melting point of about 25° C. or higher. A chloromethylation reaction mixture is heated with a $C_6$ to $C_9$ aromatic hydrocarbon in the liquid phase to dissolve the mono-chloromethylation and di-chloromethylation products and is then cooled to precipitate solid di-chloromethylation product. Solid di-chloromethylation product is separated from the aromatic hydrocarbon solution and washed with a $C_5$ to $C_8$ saturated hydrocarbon in the liquid phase to high purity. The aromatic hydrocarbon solution is vaporized to leave a residue including the mono-chloromethylated product. The residue is heated with a saturated $C_5$ to $C_8$ hydrocarbon in the liquid phase to dissolve mono-chloromethylated product therein. Then the hot saturated hydrocarbon is separated from undissolved solids and is cooled to precipitate solid mono-chloromethylated product, which is then recovered from the saturated hydrocarbon.

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3,652,690

## 2,3-DIBROMO-1,2,4-TRICHLOROBUTANE

Ryoi Ito, Tarumi-ku, and Takeshi Kojima, Hyogo-ku, Japan, assignors to Kanegafuchi Kogaku Kogyo Kabushiki, Kitaku, Osaka, Japan

No Drawing. Filed July 14, 1969, Ser. No. 841,580
Claims priority, application Japan, July 26, 1968, 43/53,123, 43/53,124; Sept. 6, 1968, 43/64,508; Nov. 22, 1968, 43/85,988, 43/85,989
Int. Cl. C07c *19/00*
U.S. Cl. 260—652 R 1 Claim

A novel compound 2,3-dibromo-1,2,4-trichlorobutane is formed by reacting bromine and 1,2,4-trichlorobut-2-ene. Such compound may be mixed with an inflammable plastic to form a self-extinguishing composition.

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3,652,691

## PYROLYSIS OF OCTAFLUOROCYCLOBUTANE

Geir Bjornson and Homer M. Fox, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Nov. 3, 1969, Ser. No. 873,433
Int. Cl. C07c *17/24, 21/18*
U.S. Cl. 260—653.3 11 Claims

Octafluorocyclobutane is converted principally to tetrafluoroethylene by pyrolysis at a given conversion level in a process comprising heating said octafluorocyclobutane to a temperature sufficient to selectively produce, in the converted products, a high yield of tetrafluoroethylene based on weight percent of the total tetrafluoroethylene and hexafluoropropene produced.

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3,652,692

## PROCESS FOR THE PREPARATION OF MIXTURES OF CHLOROFLUORINATED DERIVATIVES OF METHANE, CONTAINING MONOCHLORO-DIFLUOROMETHANE

Martino Vecchio, Milan, and Italo Cammarata, Bollate, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed July 10, 1969, Ser. No. 840,855
Claims priority, application Italy, July 11, 1968, 18,825/68
Int. Cl. C07c *17/10, 17/20*
U.S. Cl. 260—653.7 18 Claims

Mixture of chlorofluorinated derivatives of methane containing chlorodifluoromethane are prepared by chlorofluorinating methane, in the vapor phase, with $Cl_2$ and HF, in the presence of a recycling mixture of chlorinated and chlorofluorinated hydrocarbons, and of a solid fluorination catalyst.

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3,652,693

## SELECTIVE PRODUCTION OF DICHLOROETHANE

Julien Mulders and Pierre Godfrine, Brussels, Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed July 21, 1967, Ser. No. 655,164
Claims priority, application France, July 22, 1966, 70,509; May 25, 1967, 107,820
Int. Cl. C07c *17/02*
U.S. Cl. 260—662 R 9 Claims

Process for selectively producing 1,2-dichloroethane by the chlorination of the ethylene present in a mixture with acetylene by bringing a gaseous mixture of acetylene, ethylene, chlorine and inert gaseous compounds acting as diluents, in which the molar ratio of chlorine to ethylene is about 1 and the molar ratio of acetylene to ethylene is less than 3, into the presence of a contact catalyst in a reaction zone at a temperature of between 85° and 200° C. for inducing a reaction in which 1,2-dichloroethane is produced from the ethylene, with a large proportion of the acetylene remaining unchanged.

3,652,694

## PREPARATION OF SUBSTITUTED AROMATIC COMPOUNDS

George R. Lester, Park Ridge, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Mar. 18, 1970, Ser. No. 20,809
Int. Cl. C07c *15/02*
U.S. Cl. 260—668 A 9 Claims

Substituted aromatic compounds containing the same number of carbon atoms as the starting material are prepared in a two-step process by subjecting a geminally substituted cycloalkane to isomerization in the presence of a gold-containing catalyst at a temperature in the range of from about 250° to about 400° C. and thereafter aromatizing the resultant non-geminally substituted cycloalkane at an elevated temperature and pressure in the presence of certain catalysts to prepare the desired product. The process is exemplified by the conversion of 1,1-dimethylcyclohexane to ethylbenzene and o-xylene.

3,652,695

## PREPARATION OF SUBSTITUTED AROMATIC COMPOUNDS

George R. Lester, Park Ridge, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Mar. 18, 1970, Ser. No. 20,810
Int. Cl. C07c *15/02*
U.S. Cl. 260—668 A 7 Claims

Substituted aromatic compounds containing the same number of carbon atoms as the starting material are prepared in a one-step process by subjecting a geminally-substituted cycloalkane to conversion in the presence of a gold-containing catalyst at elevated temperatures above about 450° C. The process is exemplified by the conversion of 1,1-dimethylcyclohexane to ethylbenzene and o-xylene.

3,652,696

## PREPARATION OF MICROCRYSTALLINE WAXES

Sammy C. Honeycutt, Gastonia, N.C., assignor to Lithium Corporation of America, New York, N.Y.

No Drawing. Filed Sept. 4, 1970, Ser. No. 69,903
Int. Cl. C07c *15/08*
U.S. Cl. 260—668 B 9 Claims

Preparation of microcrystalline waxes by the telomerization of ethylene with p-xylene in the presence of a complex of a polylithio hydrocarbon, especially a complex of a dilithio adduct of a conjugated polyene hydrocarbon with tetramethylethylenediamine or similar amine, in the presence of an aliphatic liquid hydrocarbon at a temperature of about 90 to 110° C. at an elevated pressure.

3,652,697

## HYDROCARBON ISOMERIZATION PROCESS

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 839,086, July 3, 1969. This application Aug. 21, 1969, Ser. No. 852,118
Int. Cl. C07c *5/30, 15/04*
U.S. Cl. 260—668 A 24 Claims

Isomerizable hydrocarbons are isomerized using a catalytic composite comprising a combination of a platinum group component, a germanium component and a rhenium component with a porous carrier material. A catalytic composite comprising a platinum group component, a germanium component, a rhenium component and a Friedel-Crafts metal halide component combined with a refractory inorganic oxide is also disclosed.

3,652,698

## DEHYDROGENATION OF ETHYLBENZENE

Roger M. Benslay, Northfield, and Arthur L. Jones, Solon, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

No Drawing. Filed July 20, 1970, Ser. No. 56,696
Int. Cl. C07c *15/10, 5/18*
U.S. Cl. 260—669 4 Claims

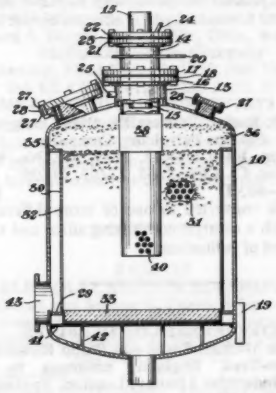
Styrene is produced by contacting a mixture of ethylbenzene, air, steam, and optionally hydrogen sulfide or sulfur dioxide with an iron oxide-containing activated carbon at an elevated temperature and recovering the product.

3,652,699

## ELECTRICAL RESISTANCE HEATED REACTORS AND DEHYDROGENATION OF ALKYL BENZENES

Frederick J. Soderquist, Essexville, and Howard Kehde and Lyle E. Martz, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 18, 1969, Ser. No. 886,116
Int. Cl. C07c *15/10, 5/18*
U.S. Cl. 260—669 16 Claims



Reactors, capable of maintaining a desired temperature in a catalyst bed by resistance to passage of electrical energy through such bed have one electrode in contact with the catalyst and the other in contact with a reactor wall, and a method of dehydrogenating alkyl benzenes in said reactor.

3,652,700

## PROCESS FOR DISPROPORTIONATION OF METHYLBENZENES

Takashi Suzuki and Hiroyuki Iesaka, Niigata, Japan, assignors to Japan Gas-Chemical Company, Inc., Tokyo, Japan

No Drawing. Filed Sept. 4, 1970, Ser. No. 69,935
Claims priority, application Japan, Sept. 9, 1969, 44/70,953
Int. Cl. C07c *3/62*
U.S. Cl. 260—672 T 9 Claims

The disproportionation of methylbenzenes including toluene and xylenes by use of HF—$BF_3$ catalyst can be accelerated by adding to the reaction system a small amount of hydrocarbon which releases a tertiary carbonium ion under the reaction condition. The reaction becomes possible to be effected at a lower temperature and in a reduced reaction time to obtain benzene or lower methylbenzenes and higher methylbenzenes, preventing the formation of by-products.

3,652,701
**IN SITU PREPARATION OF CLATHRATING SOLIDS**
Everett J. Fuller, Gillettte, N.J., assignor to Esso Research and Engineering Company
No Drawing. Continuation-in-part of application Ser. No. 823,958, May 12, 1969, now Patent No. 3,567,791. This application May 25, 1970, Ser. No. 40,396
Int. Cl. C07c *7/10*
U.S. Cl. 260—674 WC 15 Claims

A separation process in which aromatics are separated from feed streams in which they are contained by contacting said aromatics on a continuous basis with a slurry comprising a solvent and a Werner Complex which is capable of complexing with said aromatic is improved by forming said Werner Complex in situ within the solvent.

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3,652,702
**PROCESS FOR PRODUCING ISOPRENE**
Nobuyoshi Hara, TBR Bldg. 10—10, 2-chome, Nagatacho, Chiyoda-ku, Tokyo, Japan
No Drawing. Filed Mar. 20, 1970, Ser. No. 21,531
Int. Cl. B01j *11/82*; C07c *1/00, 1/20*
U.S. Cl. 208—681 9 Claims

A one-step process for producing isoprene by reacting isobutylene and formaldehyde is effected by use of a boric acid catalyst.

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3,652,703
**CONVERSION OF OLEFINS**
Robert B. Regier, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed Nov. 3, 1969, Ser. No. 873,505
Int. Cl. C07c *3/62, 11/02, 13/00*
U.S. Cl. 260—683 D 11 Claims

An olefin is converted to one or more different olefins by contact with a catalyst comprising silica and ruthenium or a compound of ruthenium.

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3,652,704
**CONVERSION OF OLEFINES**
Edward Denis Michael Eades and Philip Richard Hughes, Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Aug. 1, 1969, Ser. No. 846,965
Claims priority, application Great Britain, Aug. 23, 1968, 40,474/68; Nov. 29, 1968, 56,786/68
Int. Cl. C07c *3/62*
U.S. Cl. 260—683 D 3 Claims

A process for disproportionating olefines using an organo-metal compound and a compound of tungsten, molybdenum or rhenium, in which the tungsten, molybdenum, or rhenium is in a higher or its highest valence state, in such proportions that the atomic ratio of the metal of the organo-metal compound to tungsten, molybdenum or rhenium exceeds 2:1.

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3,652,705
**PROCESS FOR THE OLIGOMERIZATION OF ETHYLENE**
Takaaki Arakawa and Kenji Saeki, Iwakuni-shi, Yoshikuni Sato, Otake-shi, and Yoriya Kitazawa, Wakimura, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan
No Drawing. Filed Sept. 29, 1969, Ser. No. 862,029
Claims priority, application Japan, Oct. 3, 1968, 43/71,612, 43/71,613, 43/71,614, 43/71,616; Feb. 25, 1969, 44/13,605, 44/13,606; Mar. 25, 1969, 44/22,043
Int. Cl. C07c *3/10*
U.S. Cl. 260—683.15 D 6 Claims

A process for the preparation of higher olefins by oligomerization of ethylene, which comprises contacting ethylene with a catalyst in a solvent at temperatures ranging from −30 to +80° C., the catalyst being prepared by the steps of reacting titanium tetrachloride with at least one electron donor selected from the group consisting of tertiary phosphines, ketones, esters, nitriles, ethers, amines, and organic sulfur compounds, and mixing the reaction product with an aluminum alkyl halide component containing 1.8–2.8 bonded halogen atoms per one aluminum atom.

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3,652,706
**POLYMERIZATION OF OLEFINS**
George S. Saines, Fishkill, and Stanley Kravitz, Wiccopee, N.Y., assignors to Texaco Inc., New York, N.Y.
No Drawing. Filed Sept. 16, 1969, Ser. No. 858,519
Int. Cl. C07c *3/18*
U.S. Cl. 260—683.15 B 10 Claims

An olefin hydrocarbon polymerization process which produces a polymer having a molecular weight within the range of from about 700 to about 2500, by polymerizing such olefins in the presence of a catalyst system comprising a Friedel-Crafts metal halide in admixture with the hydrogen form of mordenite preferably in the presence of aluminum bromide in admixture with the hydrogen form of synthetic mordenite.

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3,652,707
**PROCESS FOR THE POLYMERIZATION OF OLEFIN HYDROCARBONS**
George S. Saines, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.
No Drawing. Filed Sept. 16, 1969, Ser. No. 858,520
Int. Cl. C07c *3/18*
U.S. Cl. 260—683.15 B 10 Claims

An olefin hydrocarbon polymerization process which produces a polymer having a molecular weight within the range of from about 700 to about 2500, by polymerizing such olefins in the presence of a Friedel Crafts metal halide catalyst in admixture with halogen containing hydrocarbon polymer cocatalyst, preferably in the presence of aluminum chloride in admixture with a poly-vinyl chloride polymer cocatalyst.

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3,652,708
**REDUCTION OF HYDROCARBON CONTENT OF SPENT SULFURIC ACID**
Ralph M. Lewis, Weston, Conn., Charles T. Lewis, Jr., Nederland, Tex., George B. Tupper, Baton Rouge, La., and Gary D. Popken, Nederland, Tex., assignors to Texaco Inc., New York, N.Y.
Filed June 24, 1970, Ser. No. 49,471
Int. Cl. C07c *3/54*
U.S. Cl. 260—683.62 9 Claims

Hydrocarbon content of spent sulfuric acid is reduced by heating with agitation at a temperature of 260–275° F. in admixture with a hydrocarbon which is non-boiling at this temperature. Method is applicable to a residue acid obtained by absorbing propylene in used sulfuric acid alkylation catalyst to form diisopropyl sulfate and extracting dipropyl sulfate therefrom with isobutane. Sulfur dioxide and propylene are evolved as off gases.

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3,652,709
**HYDROISOMERIZATION IN THE PRESENCE OF CARBON OXIDE PROMOTED CATALYST**
Joseph A. Durkin, Fishkill, John H. Estes, Wappingers Falls, and William L. Lafferty, Jr., Fishkill, N.Y., assignors to Texaco Inc., New York, N.Y.
No Drawing. Filed June 16, 1970, Ser. No. 46,803
Int. Cl. C07c *5/28*
U.S. Cl. 260—683.68 14 Claims

A method for the hydroisomerization of $C_4$–$C_7$ hydrocarbons in the presence of a chloride activated metal-

alumina catalyst, where the metal is selected from the group consisting of ruthenium, rhodium, palladium and platinum, where the selectivity of the catalyst is enhanced by treating the catalyst with a carbon oxide at a temperature within the range of about 50° F. to 400° F.

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3,652,710

## CURABLE POLYARYLENEOXIDE COMPOSITIONS

Fred F. Holub, Schenectady, and Carl M. Emerick, Mechanicville, N.Y., assignors to General Electric Company

No Drawing. Filed July 1, 1969, Ser. No. 838,316
Int. Cl. C08f *27/08*
U.S. Cl. 260—823 9 Claims

Polyaryleneoxide having at least one chemically combined aliphatically unsaturated imido radical is provided and a method for making such materials. Blends of the imido-substituted polyaryleneoxide and a variety of aliphatically unsaturated organic monomers, such as styrene, diallylphthalate, N-phenylmaleimide, or organic polymers such as polystyrene, polysulfone, polycarbonate, polyphenyleneoxides, etc., also are provided. The imido-substituted compositions of the present invention can be employed as coatings, varnishes, injection molding compounds, laminating compounds, etc.

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3,652,711

## METHOD OF POLYMERIZING SILOXANES

Hermann Triem, Wissenbach, Manfred Wick, Munich, and Siegfried Nitzsche and Karl-Heinrich Wegehaupt, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Germany

No Drawing. Filed Mar. 18, 1969, Ser. No. 808,324
Claims priority, application Germany, Mar. 18, 1968, P 17 45 572.0
Int. Cl. C08g *47/02, 47/06*
U.S. Cl. 260—825 6 Claims

High polymeric gum-like copolymers of dimethylsiloxane and methylvinylsiloxane are prepared by (1) preparation of a copolymer of 75 to 90 mol percent dimethylsiloxane units and 10 to 25 mol percent methylvinylsiloxane units and (2) equilibration of the copolymer so obtained with dimethylsiloxane.

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3,652,712

## PLASTICIZATION OF AMINO COMPOUNDS WITH HYDROLYZED COPOLYMERS OF VINYL MONOCARBOXYLATE AND PRODUCTS THEREOF

Muktar Ahmed, 3310 Mordecai, Durham, N.C. 27705, and Victorin Mallet, 70 Steadman St., Moncton, New Brunswick, Canada

Filed Nov. 27, 1968, Ser. No. 779,537
Int. Cl. C08f *19/10*
U.S. Cl. 260—837 PV 8 Claims

A dyeable and anti-static plastic composition produced by heating an intimate mixture of a non-volatile amino compound having a melting temperature lower than 150° C., with an hydrolyzed copolymer of vinyl monocarboxylate and another α-monoethylenically unsaturated compound copolymerizable therewith, the said hydrolyzed copolymer having hydroxyl groups on from 5% to 50% of the carbon atoms in the copolymer chain, the proportion by weight of said amino compound to said hydrolyzed copolymer being from 1:200 parts by weight to 200:1 parts, the said heating occuring above the melting points of said amino compound and said hydrolyzed copolymer and the process of making the same. If desired, an epoxy compound may be reacted with the product.

3,652,713

## POLYESTER COMPOSITION HAVING IMPROVED ANTISTATIC PROPERTIES, AND PROCESS FOR THE PREPARATION THEREOF

Kaoru Okazaki, Shunroku Tohyama, Minoru Nakata, and Kiyomi Kishimoto, Nagoya-shi, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 13, 1970, Ser. No. 11,041
Claims priority, application Japan, Feb. 18, 1969, 44/11,475; Feb. 21, 1969, 44/12,507
Int. Cl. C08g *39/10*
U.S. Cl. 260—860 20 Claims

A polyester composition consisting of a polyetherpolyester block copolymer consisting of a polyether segment and a polyester segment, the average degree of polymerization of said polyether segment being 100–1,000 and the polyester segment being a synthetic linear polyester. The composition forms fibers, bristles, films and other three-dimensional shaped articles, and has improved antistatic properties.

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3,652,714

## DYEABLE BLENDS OF POLY(ETHYLENE TEREPHTHALATE) AND POLYESTERETHER POLYMERS

Richard S. Berger, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Feb. 20, 1970, Ser. No. 13,211
Int. Cl. C08g *39/10;* D06 *3/04, 3/36*
U.S. Cl. 260—860 9 Claims

The disperse dyeability and dry cleaning fastness of poly(ethylene terephthalate) melt-spun fibers are greatly improved by blending the synthetic fiber-forming poly(ethylene terephthalate) with at least one polyesterether polymer.

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3,652,715

## CURABLE POLYCARBONATE COMPOSITIONS

Fred F. Holub and Milton L. Evans, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Filed July 1, 1969, Ser. No. 838,306
Int. Cl. C08f *27/08*
U.S. Cl. 260—860 7 Claims

Polycarbonate compositions are provided comprising polycarbonates substituted with at least one chemically-combined aliphatically unsaturated imido radical, such as a maleimido radical. The imido-substituted polycarbonates can be blended with various aliphatically unsaturated monomers, such as styrene, chlorostyrene, N-phenyl maleimide, diallylphthalate, triallylcyanurate, etc. and various organic polymers, such as polystyrene, polycarbonate, polysulfone, polyphenyleneoxide, polyurethane, etc. The polycarbonate, compositions of the present inventions can be employed as molding compounds, for making films, laminates, etc.

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3,652,716

## IMIDO-SUBSTITUTED POLYESTER COMPOSITIONS

Fred F. Holub and Milton L. Evans, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Filed July 1, 1969, Ser. No. 838,314
Int. Cl. C08f *27/08*
U.S. Cl. 260—860 6 Claims

Polyesters having at least one chemically combined aliphatically unsaturated imido radical, such as a maleimido radical are provided and a method for making such materials. Reaction can be effected between a polyester and an imido-substituted acylhalide, such as a maleimidobenzoylchloride in the presence of an acid acceptor. Blends of the imido-substituted polyester and a variety of aliphatically unsaturated organic monomers, such as

styrene, chlorostyrene, diallylphthalate, N-phenylmaleimide, bismaleimides or organic polymers such as polystyrenes, styrene-butadiene block copolymers, polyvinylfluoride, polyvinylchloride, polyesters, polysulfone, polysulfone ethers, polycarbonate, polyphenylene oxides, epoxy resins, phenol-formaldehyde resins, acrylonitrile butadiene styrene terpolymers, etc., also are provided. The imido-substituted polyester compositions of the present invention can be employed as coatings, varnishes, injection molding compounds, laminating compounds, etc.

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3,652,717

**PEROXIDIC COMPOSITIONS FROM DIACETONE ALCOHOL AND THEIR USE AS INITIATORS FOR POLYMERIZATION OF UNSATURATED POLYESTER RESINS**

**Hans G. Gerritsen and Arnold Schroeder, Deventer, Netherlands, assignors to Koninklijke Industrieele Maatschappij Noury & van der Lande N.V., Deventer, Netherlands**

**No Drawing. Original application Feb. 19, 1968, Ser. No. 706,608, now Patent No. 3,546,249, filed Dec. 8, 1970. Divided and this application Nov. 4, 1969, Ser. No. 870,819**

**Claims priority, application Netherlands, Feb. 21, 1967, 6702570**

**Int. Cl. C08f** *21/00, 21/02, 43/02*

**U.S. Cl. 260—861** **9 Claims**

Peroxidic compositions are provided which are useful e.g. as initiators for polymerizing unsaturated polyester resins from unsaturated polyesters and monomers containing one or more $CH_2{=}C<$ groups such as e.g. styrene. The peroxidic compositions are obtained by reacting diacetone alcohol with an aqueous solution of hydrogen peroxide under certain rather closely specified reaction conditions.

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3,652,718

**CURING OF POLYESTER COMPOSITIONS**

**Shoshana Abrahami, Beersheba, Aharon Molcho, Rehovot, and Reuven (Roman) Wachs, Beersheba, Israel, assignors to Makhteshim Chemical Works Ltd., Beersheba, Israel**

**No Drawing. Continuation-in-part of application Ser. No. 856,871, June 26, 1969, which is a division of application Ser. No. 558,627, June 20, 1966. This application Jan. 13, 1971, Ser. No. 106,288**

**Int. Cl. C08f** *21/02*

**U.S. Cl. 260—863** **6 Claims**

Uncured polyester-accelerator compositions. The compositions contain unsaturated polyester resin, water and a vanadium accelerator obtained by dissolving vanadium compound oxide in concentrated aqueous hydrochloric acid and admixing to the resulting solution an alkyl ester of phosphorous acid. There is also provided a method of curing unsaturated polyester resin wherein said resin is admixed with water and said vanadium accelerator and an organic peroxide.

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3,652,719

**TERPOLYMER OF TEREPHTHALIC ACID, AND/OR ITS ALKYL ESTERS, 1,4-BIS(2-HYDROXYETHOXY) BENZENE AND PENTAERYTHRITOL USEFUL AS A DYE RECEPTOR ADDITIVE FOR POLYOLEFIN, E.G., POLYPROPYLENE**

**James W. Cleary, Bartlesville, Okla., assignor to Phillips Petroleum Company**

**Filed May 25, 1970, Ser. No. 40,280**

**Int. Cl. C08g** *33/10, 39/10*

**U.S. Cl. 260—873** **6 Claims**

A new polyetherester prepared from terephthalic acid (TPA) or an alkyl ester thereof, the alkyl radical having from 1–4 carbon atoms, 1,4-bis(2-hydroxyethoxy)benzene and minor amounts (less than about 10 mol percent) pentaerythritol, is an effective dye receptor additive for polypropylene, especially for use in fibers.

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3,652,720

**BLENDS OF RUBBERY POLYMERS WITH BLOCK COPOLYMERS CONTAINING LACTONES**

**Roy F. Wright, Bartlesville, Okla., assignor to Phillips Petroleum Company**

**No Drawing. Filed Jan. 30, 1970, Ser. No. 7,233**

**Int. Cl. C08f** *29/12, 33/08, 37/18*

**U.S. Cl. 260—876 B** **10 Claims**

The ozone resistance of rubbery polymers is greatly improved by blending therewith a block copolymer containing a lactone to provide a final blend that contains at least 9 weight percent lactone.

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3,652,721

**NOVEL GRAFT COPOLYMER BLENDS WITH TWO DIFFERENT PARTICLE SIZES AND METHOD OF MAKING SAME**

**William O. Dalton, Hampden, and Quirino A. Trementozzi, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.**

**No Drawing. Filed July 24, 1970, Ser. No. 58,154**

**Int. Cl. C08f** *41/12, 37/18*

**U.S. Cl. 260—876 R** **15 Claims**

A latex of a rubbery polymer having a particle size of less than 0.25 micron is agglomerated by use of an organic acid anhydride to a particle size of 0.35–1.2 micron and of relatively narrow size distribution. This agglomerated rubber is subjected to grafting with a vinylidene monomer formulation. The final polyblend also contains a larger amount of small particle rubbery polymer also grafted with the vinylidene monomer formulation and a matrix of vinylidene polymer.

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3,652,722

**RUBBER-MODIFIED POLYESTER THERMOSET**

**Ray A. Dickie, Pleasant Ridge, and Robert A. Pett, Westland, Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**No Drawing. Filed Dec. 21, 1970, Ser. No. 100,467**

**Int. Cl. C08g** *45/14, 45/04, 15/00*

**U.S. Cl. 260—835** **10 Claims**

Novel thermoset materials of improved impact strength and fatigue properties are prepared from an alpha-beta olefinically unsaturated polyester prepolymer and a cross-linking amount of particulate graded-rubber having alpha-beta olefinic-unsaturation surface functionality. The graded-rubber particles have a rubbery core and a glass-like polymeric outer shell.

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3,652,723

**THERMOSET MOLDING POWDERS EMPLOYING POLYCARBOXYL FUNCTIONAL PREPOLYMER AND DIEPOXIDE CROSSLINKING AGENT**

**John F. Fellers, Livonia, Seymour Newman, Southfield, and Amos Golovoy, Westland, Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**No Drawing. Filed Nov. 16, 1970, Ser. No. 90,052**

**Int. Cl. C08g** *45/04*

**U.S. Cl. 260—836** **16 Claims**

Novel thermosetting resin powders which can be molded to form products characterized, in tensile measurement, by high elongation-to-break, high strength and modulus and by a high glass transition temperature are prepared from a mixture of a prepolymer consisting essentially of methacrylic acid, methyl methacrylate, and methacrylonitrile or acrylonitrile and a diepoxide cross-linking agent.

3,652,724

## PROCESS FOR PRODUCING BLOCK COPOLYMERS

Takatoshi Shimomura, Toyonaka-shi, and Ken-Ichi Kudo, Suita-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Filed Feb. 16, 1970, Ser. No. 11,878
Claims priority, application Japan, Feb. 27, 1969, 44/15,081; May 26, 1969, 44/41,209
Int. Cl. C08f *29/12, 29/50, 33/08*
U.S. Cl. 260—877 11 Claims

A block copolymer composed of a polymer block of an anionically polymerizable conjugated vinyl compound and a polymer block of a radically polymerizable monomer is produced by polymerizing a conjugated vinyl compound giving a stable carbanion, such as for example, a monovinyl aromatic compound, a vinylpyridine, a methacrylic acid ester, a vinylketone or a conjugated diene, in a solvent using as a catalyst an alkali metal, an organolithium compound or an aromatic hydrocarbon-alkali metal complex, thereby obtaining a living polymer and (1) treating the said living polymer with an azonitrile to synthesize a polymer having an azo group in the main chain and then thermally decomposing the resulting polymer in the presence of a radically polymerizable monomer such as, for example, an unsaturated halide, an allyl compound, acrylic acid, an acrylic acid ester, a vinyl compound, a diene or acrylamide, or (2) treating the abovementioned living polymer with oxygen to synthesize a polymer having a hydroperoxy group at the polymer chain end and then subjecting the resulting polymer to thermal decomposition or redox decomposition in the presence of the above-mentioned radically polymerizable monomer, thereby polymerizing the said radically polymerizable monomer.

Block copolymers obtained according to the abovementioned process are white powders and can be made into various molded and shaped articles by use of such thermoplastic resin-processing means as injection molding, compression molding, blow molding, fiber extrusion or film extrusion means.

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3,652,725

## EXTRUSION COATING COMPOSITIONS

Juan C. Diaz and Robert A. Mears, Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Sept. 23, 1970, Ser. No. 74,928
Int. Cl. C08f *29/12*
U.S. Cl. 260—876 B 6 Claims

Extrusion coating compositions providing coatings having an improved balance of properties including good adhesion to the substrate and substantial elimination of pinholes are disclosed. These coatings are composed of polyethylene, crystalline propylene containing polymer and either a polymerized DAC-B hydrocarbon resin or a vinyl toluene-alpha-methyl styrene copolymer.

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3,652,726

## THERMOPLASTIC COMPOSITIONS

Eric Nield, Watton-at-Stone, and John Brewster Rose, St. Albans, England, assignors to Imperial Chemical Industries Limited, London, England.

No Drawing. Continuation-in-part of application Ser. No. 447,971, Apr. 14, 1965. This application May 17, 1968, Ser. No. 729,891
Claims priority, application Great Britain Apr. 21, 1964, 16,502/64; Nov. 6, 1964, 45,289/64; May 22, 1967, 23,670/67
Int. Cl. C08f *17/00*
U.S. Cl. 260—876 7 Claims

A high softening thermoplastic composition derived from acrylonitrile, N-aryl maleimide and an aromatic olefin is (i) a graft copolymer (a) comprising a diene rubber substrate and a superstrate resin of 1 to 50% acrylonitrile, 1 to 50% N-aryl maleimide and 1 to 98% aromatic olefin; (ii) a blend of the graft copolymer (a) with acrylonitrile/aromatic olefin resin; (iii) a blend of graft copolymer (a) with a compatible resin; (iv) a blend of graft copolymer (a) with an ABS resin; or (v) a blend of a resin of 1 to 50% acrylonitrile, 1 to 50% N-aryl maleimide and 1 to 95% aromatic olefin with an ABS graft copolymer. The grafts and their blends can be used to make shaped articles having good resistance to impact.

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3,652,727

## VINYL CHLORIDE SERIES RESIN COMPOSITIONS

Shuzo Yonezu, Nishinomiya, and Takeshi Tanaka, Minoru Tsuzuki, and Takashi Kobayashi, Settsu, Japan, assignors to Kanegafuchi Kagaku-Kogyo Kabushiki-Kaisha, Osaka, Japan

No Drawing. Filed Sept. 29, 1969, Ser. No. 862,068
Claims priority, application Japan, Oct. 15, 1968, 43/75,151
Int. Cl. C08f *29/24, 29/50, 29/56*
U.S. Cl. 260—876 R 13 Claims

Vinyl chloride series resin compositions particularly excellent in processing property comprise more than 60 parts by weight of vinyl chloride series resins and less than 40 parts by weight of the graft polymers obtained by graft-polymerizing with less than 10 parts by weight of synthetic rubber, 100 parts by weight of monomers consisting of 30–85% by weight of methacrylic esters, 10–60% by weight of vinyl aromatic hydrocarbons and 2–30% by weight acrylonitrile series monomer or more than 80% by weight of these three ingredients and less than 20% by weight of comonomers copolymerizable therewith.

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3,652,728

## CHLORINATED ETHYLENE POLYMER COMPOSITIONS FOR ELECTRICAL INSULATION

Clement J. Cornay, Lafayette, and Allen R. Guy and Warren L. Young, Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 689,259, Dec. 11, 1967. This application Feb. 9, 1970, Ser. No. 10,001
Int. Cl. C08f *29/04, 29/14*
U.S. Cl. 260—878 R 5 Claims

This invention is directed to compositions consisting essentially of certain inherently flexible suspension chlorinated ethylene polymers, from 1 to 10 parts by weight per 100 parts of chlorinated ethylene polymer of a crosslinkable polyfunctional monomer, from 1 to 10 parts by weight per 100 parts of chlorinated ethylene polymer of a polybutadiene having from about 20 to 25 percent of vinyl unsaturation and a molecular weight of about 2500, and a chemical curing agent for the chlorinated ethylene polymer; which compositions may be rapidly cured to form easily processable, tough, smooth, coherent, inherently flexible coverings for electrical conductors.

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3,652,729

## BRANCHED-CHAIN HYDROCARBON ELASTOMERS

Nicolas Brodoway, Claymont, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 19, 1970, Ser. No. 38,861
Int. Cl. C08f *15/40*
U.S. Cl. 260—878 R 4 Claims

The incorporation of about 1%–10% by weight of polybutadiene units, each unit containing about 25–750 vinyl groups, in an EPDM elastomer produces chain branching with a consequent improvement in properties, such as cold-flow of the uncured stock, and improved ozone resistance of natural rubber blends.

**3,652,730**

## PROCESS FOR GRAFTING POLYMERISABLE MONOMERS ONTO CRYSTALLINE UNPREACTIVATED POLYOLEFINES

**Claude Favie, Billere, and Werner Dellsperger and Philippe Meline, Pau, France, assignors to Société Anonyme dite: Société Nationales des Petroles d'Aquitaine, Courbevoie, France**

**No Drawing. Filed June 24, 1969, Ser. No. 836,146**
**Claims priority, application France, June 28, 1968, 157,144**
**Int. Cl. C08f** *15/00*
**U.S. Cl. 260—878 R** **19 Claims**

A process for grafting polymerisable monomers onto crystalline unpreactivated polyolefines in an aqueous suspension and with the aid of chemical producers of free radicals comprises forming a suspension of the crystalline polyolefine containing the monomer to be grafted, bringing this polyolefine to a temperature which is at least equal to the fusion temperature, adding the producer of free radicals to the suspension and maintaining the reaction temperature at at least the said fusion temperature during the grafting reaction.

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**3,652,731**

## NEW POLYMERIC COMPOSITIONS

**Gerald P. Coffey, Cleveland Heights, and Lawrence E. Ball, Cuyahoga Falls, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio**

**No Drawing. Continuation-in-part of application Ser. No. 799,094, Feb. 13, 1969. This application Nov. 13, 1970, Ser. No. 89,504**
**Int. Cl. C08f** *1/13, 15/16, 19/08*
**U.S. Cl. 260—879** **10 Claims**

Impact-resistant thermoplastic polymers having low permeability to gases and vapors are prepared by polymerizing acrylonitrile with an alpha-olefin such as isobutylene, at least one member selected from the group consisting of an acrylic ester, a methacrylic ester, methacrylonitrile, an acrylamide, and a vinyl ester, and optionally another vinyl monomer component such as a vinyl aromatic monomer in an aqueous medium in the presence of a rubbery polymer of a conjugated diolefin.

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**3,652,732**

## SOLVENTLESS ENCAPSULATING BLOCK COPOLYMERS

**Henry S. Makowski, Scotch Plains, Merrill Lynn, Elizabeth, and John J. Jaruzelski, Westfield, N.J., assignors to Esso Research and Engineering Company, Linden, N.J.**

**No Drawing. Continuation-in-part of application Ser. No. 545,839, Apr. 28, 1966. This application Nov. 5, 1968, Ser. No. 773,630**
**Int. Cl. C08f** *15/04*
**U.S. Cl. 260—880 B** **7 Claims**

Solventless, room temperature-pourable, encapsulating block copolymers and terpolymers may be prepared by polymerizing a diolefin (e.g. butadiene) or copolymerizing a diolefin-monovinyl aromatic hydrocarbon (e.g. butadiene and styrene) with an organolithium catalyst so as to obtain a poly-diolefin homo- or copolymer-terminated with lithium residues. The lithium-containing homo- or copolymer is then reacted with a multi-vinyl compound (e.g. divinyl benzene) and the resultant block co- or terpolymer is recovered after inactivation of the catalyst.

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**3,652,733**

## CURABLE POLYMERS AS PLASTICIZERS

**Noel Ernest Davenport, % W. R. Grace & Co., Cromwell Road, St. Neots, England**

**No Drawing. Filed Feb. 9, 1970, Ser. No. 10,032**
**Int. Cl. C08f** *29/24, 45/38*
**U.S. Cl. 260—884** **4 Claims**

Thermoplastic polymer compositions contain a plasticiser having addition-polymerisable double bonds and a polythiol. The compositions can be cured by exposure to free-radicals, and it is believed that the cured product is a polythioether. Preferably the thermoplastic polymer is vinyl chloride and the plasticiser diallyl phthalate. The compositions are useful for forming protective or decorative coatings.

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**3,652,734**

## DYEABLE POLYOLEFIN COMPOSITION

**Milton Farber, Verona, and Ronald W. Fuest, Kinnelon, N.J., assignors to Uniroyal, Inc., New York, N.Y.**

**No Drawing. Filed May 1, 1970, Ser. No. 33,987**
**Int. Cl. C08f** *29/12*
**U.S. Cl. 260—897 B** **20 Claims**

A dyeable fiber-forming composition comprising a major amount of polyolefin blended with a minor amount of a high molecular weight ethylene oxide containing polymer and a styrene-acrylonitrile copolymer.

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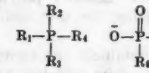
**3,652,735**

## QUATERNARY PHOSPHONIUM DIALKYL PHOSPHATES

**Ingenuin Hechenbleikner and Kenneth R. Molt, Cincinnati, Ohio, assignors to Carlisle Chemical Works, Inc., Reading, Ohio**

**No Drawing. Filed May 1, 1969, Ser. No. 821,136**
**Int. Cl. A01n** *9/36;* **C07f** *9/54*
**U.S. Cl. 260—926** **2 Claims**

Compound of the formula



are prepared by reacting a tertiary phosphine of the formula

with a phosphate, primary phosphonate or secondary phosphonate of the formula

where $R_1$, $R_2$ and $R_3$ are alkyl, haloalkyl, alkenyl, aralkyl, aryl or haloaryl, $R_4$ is methyl or ethyl and $R_5$ and $R_6$ are the same or different and are $OR_7$ and $R_8$ where $R_7$ and $R_8$ are alkyl, haloalkyl, alkenyl, aralkyl, aryl or haloaryl. The compounds are useful as flame proofing agents, wetting agents, fungicides and bactericides.

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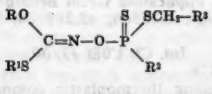
**3,652,736**

## OXIMINOPHOSPHONODITHIOATES

**Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, New York, N.Y.**

**No Drawing. Filed Apr. 6, 1970, Ser. No. 26,149**
**Int. Cl. C07d** *105/02;* **C07f** *9/40*
**U.S. Cl. 260—940** **6 Claims**

Compounds having the formula



in which R is (1) alkyl or (2) allyl; $R^1$ is alkyl; $R^2$ is alkyl; and $R^3$ is (1) hydrogen, (2) lower alkylthio, (3)

cyano, (4) phenylthio, (5) substituted phenylthio wherein the substituent is halogen, (6) ethynyl, or (7)

$$CCl_2{=}CH{-}$$

their use as insecticides and acaricides, a process for preparing the compounds, intermediates and a process for preparing the intermediates.

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**3,652,737**
**OXIME CARBAMATE PHOSPHATE, PHOSPHONATE, PHOSPHINATE AND PHOSPHOROAMIDATES**

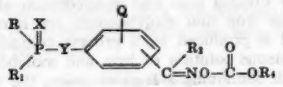
**Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, New York, N.Y.**

**No Drawing. Application May 20, 1968, Ser. No. 730,588, which is a continuation-in-part of application Ser. No. 646,467, June 16, 1967. Divided and this application June 25, 1970, Ser. No. 49,933**

**Int. Cl. A01n** *9/36;* **C07f** *9/12, 9/18*

**U.S. Cl. 260—944** **3 Claims**

Oxime carbamate phosphates, phophonates, phosphinates and phosphoroamidates having the general formula:



in which X and Y are independently selected from the group consisting of oxygen and sulfur; R is selected from the group lower alkyl or lower alkoxy, having from 1 to 6 carbon atoms inclusive; $R_1$ is selected from the group consisting of lower alkyl or lower alkoxy having from 1 to 6 carbon atoms, inclusive, amino, lower alkyl-substituted amino and phenyl; Q is selected from the group consisting of divalent tetramethylenediene-1,3, lower alkoxy or lower alkyl having from 1 to 4 carbon atoms inclusive, each, nitro, halogen and combinations thereof, and lower dialkyl-substituted thionophosphoryloxy; $R_2$ is selected from the group consisting of hydrogen, lower alkyl having from 1 to 4 carbon atoms, and phenyl; $R_4$ is lower alkyl having from 1 to 4 carbon atoms, inclusive, and $\beta$-chloro-loweralkyl having from 2 to 4 carbon atoms.

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**3,652,738**
**ISOPHORONE PHOSPHONATES**

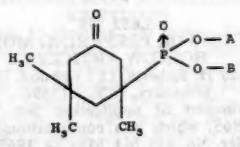
**Abdul-Munim Nashu, Hamden, Henri Ulrich, Northford, and Adnan A. R. Sayigh, North Haven, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.**

**No Drawing. Filed Oct. 1, 1969, Ser. No. 862,972**

**Int. Cl. C07f** *9/40*

**U.S. Cl. 260—946** **2 Claims**

Compounds are disclosed having the formula:



wherein A and B are members selected from the group consisting of lower hydroxyalkyl, hydroxyaryl of 6 to 12 carbon atoms and a moiety of formula

wherein R is lower-alkylene of 2 to 12 carbon atoms having 2 carbon atoms separating the valencies, and $n$ is an integer of 2 to 20. These compounds are useful as flame retarding components of polymer systems such as polyurethane and polyamide foam systems.

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**3,652,739**
**(CIS-1,2-EPOXYPROPYL)PHOSPHONIC ACID INTERMEDIATES**

**Peter I. Pollak, Scotch Plains, Norman L. Wendler, Summit, and Burton G. Christensen, Scotch Plains, N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**No Drawing. Continuation-in-part of application Ser. No. 729,424, May 15, 1968. This application Aug. 27, 1968, Ser. No. 755,729**

**Int. Cl. C07f** *9/38, 9/40*

**U.S. Cl. 260—948** **10 Claims**

A method for the preparation of (±) and (—) (cis-1,2-epoxypropyl)phosphonic acid and its corresponding salts and ester derivatives which comprises treating a 1,2-disubstituted n-propylphosphonic acid or a salt or ester thereof under ring closure conditions, at least one of which substitutents is hydroxy or a functionally equivalent oxygen-containing moiety and the remaining substituent being any leaving group which can be displaced to yield the desired epoxide product.

The (±) and (—) (cis-1,2-epoxypropyl)phosphonic acid of this invention and its salts are antibiotics which have utility as antibacterials in inhibiting the growth of gram-positive and gram-negative pathogenic bacteria.

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**3,652,740**
**O-ALKYL-O-PHENYL-THIOLPHOSPHORIC ACID ESTERS**

**Gerhard Schrader, Wuppertal-Cronenberg, Ingeborg Hammann, Cologne, Wilhelm Stendel, Wuppertal-Vohwinkel, and Gunter Unterstenhofer and Bernhard Homeyer, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany**

**No Drawing. Filed Aug. 1, 1969, Ser. No. 846,938**

**Claims priority, application Germany, Aug. 13, 1968, P 17 93 188.3**

**Int. Cl. A01n** *9/36;* **C07f** *9/12, 9/14*

**U.S. Cl. 260—949** **6 Claims**

O-alkyl-O-phenyl-thiolphosphoric acid esters, i.e. O-alkyl - O - (3-methyl-4-methylmercapto-phenyl)-S-(alkylmercapto-methyl and $\beta$ - alkylmercapto-ethyl)thiolphosphoric acid esters, which possess arthropodicidal, especially acaricidal and insecticidal, and nematocidal properties and which may be produced by conventional methods.

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**3,652,741**
**MONO(ALKYL AND ALKENYL)MONO-OMEGA-ALKYNYLARALKYL PHOSPHONATES**

**Ronald Eugene Montgomery, Middleport, and Harry Hobart Incho, Medina, N.Y., assignors to FMC Corporation, New York, N.Y.**

**No Drawing. Continuation-in-part of application Ser. No. 630,204, Apr. 12, 1967, which is a continuation-in-part of applications Ser. No. 559,422, June 22, 1966, and Ser. No. 624,689, Mar. 21, 1967. This application Feb. 18, 1969, Ser. No. 800,264**

**Int. Cl. A01n** *936;* **C07f** *9/40*

**U.S. Cl. 260—956** **3 Claims**

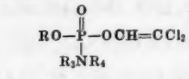
Mono (alkyl and alkenyl) mono-$\omega$-alkynyl aryl-and aralkylphosphonates are described. The compounds are combined with esters of certain cyclopropanecarboxylic acids, e.g. pyrethrins, allethrin and related compounds to form synergistic insecticidal compositions.

## 3,652,742
## 2,2-DICHLORO-VINYLPHOSPHORIC ACID ESTER AMIDES

**Wilhelm Sirrenberg, Sprockhovel, Ingeborg Hammann, Cologne, Wolfgang Behrenz, Cologne-Stammheim, Wilhelm Stendel, Wuppertal-Vohwinkel, and Gunter Unterstenhofer, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany**

**No Drawing. Filed May 3, 1968, Ser. No. 726,554**
**Claims priority, application Germany, May 6, 1967, F 52,338**
**Int. Cl. C07f** *9/24;* **A01n** *9/36*
**U.S. Cl. 260—957** **9 Claims**

2,2-dichloro-vinyl-phosphoric acid ester amides having acaricidal properties of the formula



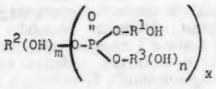
wherein R is hydrocarbon, $R_3$ is hydrogen and $R_4$ is halogen and hydrocarbon.

## 3,652,743
## PREPARATION OF HYDROXYALKYL PHOSPHATES AND POLYPHOSPHATES

**Guy H. Harris, Concord, Robert S. Olson, Lafayette, and Robert D. Wilcox, Palo Alto, Calif., assignors to The Dow Chemical Company, Midland, Mich.**

**No Drawing. Filed Mar. 26, 1968, Ser. No. 715,992**
**Int. Cl. C07f** *9/08, 9/12*
**U.S. Cl. 260—982** **9 Claims**

A process is disclosed for the preparation of hydroxyalkyl phosphates. Cyclic bis-alkylene pyrophosphates are converted to hydroxyalkyl phosphate and polyphosphate compounds having the formula



wherein $R^1$ represents a divalent vicinal alkylene radical, $R^2$ represents a hydrocarbyl radical which may be substituted or unsubstituted, $R^3$ represents hydrogen or a radical of the $R^2$ type, *m* and *n* are integers having a value of from 0 to 7 each, and *x* is an integer having a value of from 1 to 8.

## 3,652,744
## METHOD OF MAKING NUCLEAR FUEL ELEMENTS

**Richard C. Dahlberg, La Jolla, and Walter V. Goeddel, San Diego, Calif., assignors to the United States of America as represented by the United States Atomic Energy Commission**

**No Drawing. Filed Nov. 19, 1969, Ser. No. 878,198**
**Int. Cl. G21c** *21/02*
**U.S. Cl. 264—.5** **3 Claims**

Nuclear fuel elements which contain different amounts of nuclear fuel in the form of minute particulate nuclear fuel cores having fission product-retentive coatings are made using casings which have the same amount of fuel chamber volume for holding the nuclear fuel. First and second groups of coated fuel particles are used which vary from each other either in core composition, core size, or coating thickness and thereby contain different amounts of nuclear fuel per unit volume of coated particles. Thus, different fuel elements contain different amounts of nuclear fuel as a result of containing different relative amounts of coated nuclear fuel particles from the first and second groups.

## 3,652,745
## METHOD OF FABRICATING POROUS METAL BODIES

**Neal P. Strazza, Towson, Md., assignor to Isotopes, Inc., Westwood, N.J.**

**No Drawing. Filed July 30, 1969, Ser. No. 846,284**
**Int. Cl. G21c** *21/00, 21/02*
**U.S. Cl. 264—.5** **24 Claims**

In the fabrication of porous metal bodies, and in particular, control bodies for nuclear reactors with or without integral fuel material, by powder metallurgical techniques, the utilization of a metal hydride binder imparts green strength to the body formed prior to sintering and results in a sintered body with smooth, strong bonds connecting the powder particles and with clean, uncontaminated interior surfaces.

## 3,652,746
## PROCESS FOR PRODUCING METAL POWDER CONTAINING IRON AND MOLYBDENUM

**Roger B. Bargainnier, Madison, Wis., and William Scheithauer, Jr., Towanda, Pa., assignors to Sylvania Electric Products Inc., Seneca Falls, N.Y.**

**No Drawing. Filed Feb. 13, 1970, Ser. No. 11,355**
**Int. Cl. B01j** *2/04*
**U.S. Cl. 264—14** **8 Claims**

A finely divided iron and molybdenum alloy powder wherein the iron and molybdenum are homogeneously distributed is produced by a process comprising: forming an aqueous solution of iron and molybdenum compound each containing a fugitive anion, the weight ratio of iron to molybdenum in the solution is from about 1:10 to about 4:1, the solution that is formed is thereafter atomized into droplets having a size of less than about two microns in a chamber containing a gas having a temperature of from about 150° C. to about 450° C. to form discrete particles containing iron and molybdenum and thereafter heating the particles in a reducing atmosphere to reduce the iron and molybdenum compounds and to form at least some $Fe_3Mo_2$.

## 3,652,747
## PROCESS FOR MANUFACTURING SYNTHETIC LEATHER

**Hiroharu Shirota, Osaka, Kunio Yonemoto, Ikeda, Tuyoshi Masuda, Kobe, Takayuki Ito, Amagasaki, and Ryuzo Nagaki, Izumi-Otsu, Japan, assignors to Dainippon Ink and Chemicals, Incorporated, Tokyo, Japan**

**No Drawing. Filed Mar. 9, 1970, Ser. No. 17,909**
**Claims priority, application Japan, Mar. 17, 1969, 44/19,551; Apr. 7, 1969, 44/26,173**
**Int. Cl. B29d** *27/04*
**U.S. Cl. 264—41** **13 Claims**

A process for manufacturing a synthetic leather made up of a base cloth, a sponge layer (at times also a skin layer) and a surface treating agent layer, in which the sponge layer is formed by using an aqueous dispersion containing gas bubbles which has been obtained by mixing a polyurethane resin.

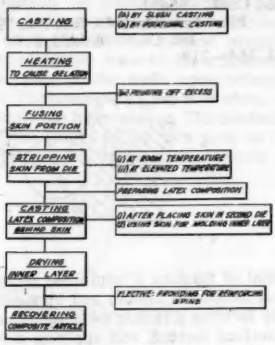
## 3,652,748
## PROCESS FOR PREPARING MOLDED HOLLOW ARTICLES

**Arthur H. Roberts, 12 Lynwood, Drive, Westbury, N.Y. 11590**

**Continuation-in-part of application Ser. No. 475,989, July 30, 1965, which is a continuation-in-part of applications Ser. No. 455,764, May 14, 1965, and Ser. No. 22,002, Apr. 13, 1960. This application Sept. 18, 1968, Ser. No. 774,230**
**The portion of the term of the patent subsequent to Oct. 7, 1985, has been disclaimed**
**Int. Cl. B29c** *13/04*
**U.S. Cl. 264—45** **9 Claims**

Process for preparing rigid, three-dimensional, hollow article comprising an outer layer component and an inner

layer component. The article is formed by preparing separately (1) a premolded skin from a pliable plastic material


CASTING
(a) BY SLUSH CASTING
(b) BY ROTATIONAL CASTING
HEATING TO CAUSE GELATION
(a) REMOVING OFF EXCESS
FUSING SKIN PORTION
STRIPPING SKIN FROM DIE
(1) AT ROOM TEMPERATURE
(2) AT ELEVATED TEMPERATURE
PREPARING LATEX COMPOSITION
CASTING LATEX COMPOSITION BEHIND SKIN
(1) AFTER PLACING SKIN IN SECOND DIE
(2) USING SKIN FOR MOLDING INNER LAYER
DRYING INNER LAYER
ELECTIVE: PROVIDING FOR REINFORCING STRAND
RECOVERING COMPOSITE ARTICLE

and (2) a filler-containing latex composition. The latex composition is cast behind the premolded skin, is dried and the article is recovered.

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**3,652,749**

## CONTINUOUS DRAWING OF FIBERS FROM A MIXTURE CONTAINING AN INORGANIC OXIDE SOL COVERED BY A PROTECTIVE FLUID

**Jay E. Sobel, Des Plaines, and John C. Foley, Waukegan, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.**

**No Drawing. Filed Jan. 26, 1970, Ser. No. 5,916**
**Int. Cl. D01d** *5/04, 1/02;* **C04b** *35/10*
**U.S. Cl. 264—63** **18 Claims**

A method of preparing refractory inorganic oxide fibers. A refractory inorganic oxide sol, e.g., an alumina sol, is admixed with a soluble fiber-forming organic polymer, e.g. (a polyethylene oxide). This mixture after being concentrated to a viscosity of 1–3000 poises, is covered with a water immiscible and moderately volatile liquid, e.g., n-hexane, after which fibers are drawn up from the mixture. The organic matter is thereafter burned from the fibers which are calcined at 300–1000° C. The fiber forming mixture may also contain a soluble organic amine. The layer of water immiscible liquid permits continuous fibers to be drawn from the concentrated mixture without breaking which has been a problem in the prior art. After the fibers are drawn the layer of water immiscible liquid remaining on their surfaces vaporizes.

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**3,652,750**

## CHROMIUM-SILICON MONOXIDE FILM RESISTORS

**Reinhard Glang, 13 Horizon Hill Drive 12603; Richard A. Holmwood, Haviland Road, Cedar Apartments 12601; and Leon I. Maissel, 6 Vincent Road, R.D. 2 12603, all of Poughkeepsie, N.Y.; and Jean Vergnolle, 46 Route de Croissy, 78 Le Vesinet, France**

**Filed Mar. 30, 1967, Ser. No. 627,173**
**Int. Cl. B28b** *11/16;* **B44d** *11/18*
**U.S. Cl. 264—67** **17 Claims**

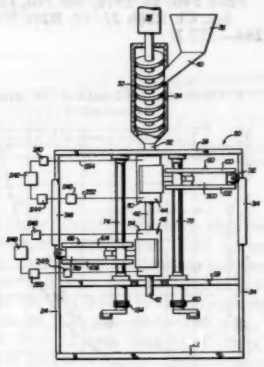
A chromium-silicon monoxide film resistor produced by admixing chromium and silicon monoxide in a predetermined atomic ratio ranging from 90:10 to 50:50 in powder form, admixing with a binder, heating and forming into pellets. These pellets are then caused to evaporate at high temperatures resulting in highly accurate compositional film deposits of chromium-silicon monoxide.

**3,652,751**

## METHOD AND APPARATUS FOR BLOW MOLDING PLASTIC ARTICLES

**Donald H. Criss, Toledo, Ohio, and Erwin P. Pollitt, Glencoe, Ill., assignors to Owens-Illinois, Inc.**

**Filed June 20, 1969, Ser. No. 835,091**
**Int. Cl. B29c** *17/07*
**U.S. Cl. 264—99** **15 Claims**



A plastic blow molding machine for the manufacture of bottles or the like articles and capable of extremely rapid operation, multiple molds being used to successively engage spaced portions of a continuously extruded vertically disposed tube. The closed molds move vertically with the tube during blowing, and each mold in succession opens to release the blown article, the opened mold returning toward the extrusion orifice by passing around the next consecutive, closed mold. This "hand-over-hand" operation forms a series of blown articles linked together by non-blown waste portions.

To speed up the cycle, a purely mechanical drive system is utilized, eliminating any delays for limit switch operation, valve opening and the like. The vertical drive for the molds incorporates cranks driven from a common crankshaft, and the mold opening and closing movements are also driven from this crankshaft. Rotary valves on the crankshaft control the introduction and exhaust of blown air. The resultant apparatus is extremely simple, foolproof and the sequencing of the method steps is carried out automatically.

The molds are refrigerated in order to reduce the mold-closed time, the mold itself receiving gaseous refrigerant directly from the evaporator of a refrigeration unit.

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**3,652,752**

## PRESSURE TREATMENT OF DISPERSED GRANULES

**Christian Rosenthal, Berg, near Starnberg, Germany, assignor to Chemiche Werke Munchen Otto Barlocher G.m.b.H., Munich, Germany**

**No Drawing. Continuation-in-part of application Ser. No. 725,271, Apr. 26, 1968, now Patent No. 3,577,489, which is a continuation-in-part of application Ser. No. 649,088, June 26, 1967, which in turn is a continuation-in-part of applications Ser. No. 609,712, Jan. 10, 1967, and Ser. No. 631,885, Apr. 19, 1967. This application Dec. 10, 1968, Ser. No. 782,763**
**Int. Cl. B01j** *2/10*
**U.S. Cl. 264—117** **4 Claims**

Solid materials (e.g. polyvinyl chloride) which are granulated and dispersed in a liquid medium in which they are insoluble (e.g. water) are submitted to a pressure of

at least 1.5 atmospheres. The pressure treatment increases the bulk density of the granulated solid and results in particles having a smooth surface and other improved properties.

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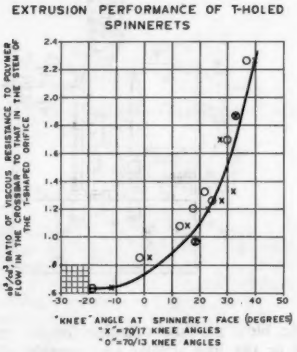
**3,652,753**
**PROCESS FOR EXTRUDING FILAMENTS HAVING ASYMMETRIC CROSS-SECTION**
**Bejar Hazin Shemdin, Brooklyn, N.Y. assignor to Fiber Industries, Inc.**
**Filed Feb. 26, 1970, Ser. No. 14,352**
**Int. Cl. B28h** *21/54;* **B29f** *3/00*
**U.S. Cl. 264—177 F** **4 Claims**




A process to reduce kneeing during the melt spinning of continuous filaments through a T-shaped orifice by selecting dimensions of the orifice so that its extrusion factor is within a defined range.

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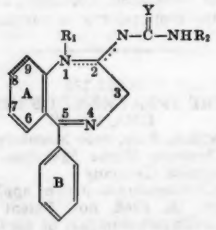
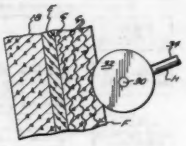
**3,652,754**
**BENZODIAZEPINE DERIVATIVES**
**Kanji Meguro, Nishinomiya, Yutaka Kuwada, Ashiya, Yuji Nagawa, Otokunigun, and Toru Masuda, Nishinomiya, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**
**No Drawing. Filed Aug. 22, 1969, Ser. No. 852,471**
**Claims priority, application Japan, Aug. 26, 1968, 43/61,070**
**Int. Cl. A61k** *27/00;* **C07d** *53/06*
**U.S. Cl. 260—239 BD** **18 Claims**

Benzodiazepine derivatives of the formula



wherein $R_1$ is hydrogen or alkyl, $R_2$ is a hydrocarbon group, Y is oxygen or sulfur atom and the respective benzene rings A and B may have one or more substituents from the group of nitro, trifluoromethyl, halogen, alkyl and alkoxy, and their 4 N-oxides, and pharmaceutically acceptable salts thereof, are useful tranquilizing, muscle relaxant and anticonvulsant agents.

**3,652,755**
**METHOD OF FORMING REINFORCED CONCRETE STRUCTURE**
**Martin E. Iorns, 1512 Lakewood Drive, and Louis L. Watson, 1601 Lakewood Drive, both of West Sacramento, Calif. 95691**
**Filed Jan. 27, 1969, Ser. No. 794,229**
**Int. Cl. B29d** *3/02, 9/02*
**U.S. Cl. 264—219** **1 Claim**



Method of forming a reinforced hollow marine structure that includes a bottom and upwardly extending side walls by forming a female mold that conforms to the exterior surface thereof, and applying a first cementitious layer to the interior of said mold. A second cementitious layer is applied to the first layer, with first reinforcing means being pressed into the second layer while it is plastic. Reinforcing means so pressed into the second layer is in full surface contact therewith, and maximum strength is obtained therefrom. The marine structure is removed from the mold after the layers have become dimensionally stable.

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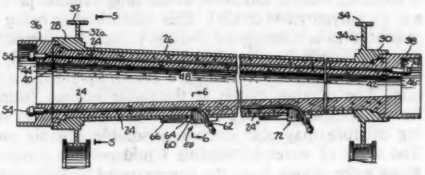
**3,652,756**
**REINFORCEMENT OF CONCRETE STRUCTURES**
**Myers Van Buren, Cheriton, Va., assignor to Bayshore Concrete Products Corp., Cape Charles, Va.**
**Original application May 18, 1967, Ser. No. 639,371, now Patent No. 3,501,881, dated Mar. 24, 1970. Divided and this application Jan. 16, 1970, Ser. No. 8,139**
**Int. Cl. B28b** *1/20, 21/22, 23/04*
**U.S. Cl. 264—228** **1 Claim**



Use of pretensioned elongated reinforcing rods in concrete structures, the rods being terminated at various intermediate ends of the structure, and special anchor arrangements for permitting intermediate termination of the rods.

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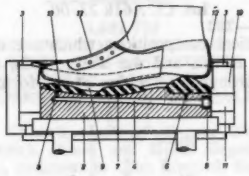
**3,652,757**
**METHOD FOR INJECTION MOLDING OF MULTILAYER SOLES OF ELASTOMERS ONTO UPPERS OF A SHOE**
**Karl-Heinz Wessel, Vlotho, and Erich Sabadello, Bad Oeynhausen, Germany, assignors to Firma Stubbe Maschinenfabrik G.m.b.H., Kalletal-Kalldorf, Germany**
**Filed Aug. 14, 1968, Ser. No. 752,608**
**Claims priority, application Germany, Oct. 20, 1967, St. 27,488**
**Int. Cl. B29h** *3/08*
**U.S. Cl. 264—244** **1 Claim**

A method of injection molding a multilayer sole of elastomers onto an upper of a shoe by means of a multipart mold which includes a last carrying the upper of the

shoe. Side cheeks are movable relative to each other and a sole plate is displaceable relative to the last. The sole plate provided with a sprue channel, extending in the longitudinal direction of the sole plate, and further provided with a plurality of junction channels distributed along the length of the sprue channel and terminating in a hollow space of the mold. The method comprises the steps of injecting elastomer material for a first sole layer into the hollow space of the mold upon enlarging the hollow space by displacement of the sole plate, without filling up completely the hollow space. The elastomers are distributed over the length of the sole plate in dependence upon the number of the junction channels chosen.



The cross-sections of the junction channels and the injection speed relative to each other, are adjusted such, that the distribution takes place in quantities of said elastomer material required for the formation of the toe end, the heel end and the center part of that sole layer, respectively. The elastomer material is pressed onto the upper of the shoe by slow displacement of the sole plate towards the last. A sole layer is formed by slow build-up of a pressure in the hollow space of the mold, and by injecting thereafter again elastomer material into the enlarged hollow space of said mold, a second sole layer is formed by renewed slow displacement of the sole plate towards the last.

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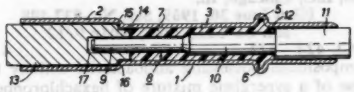
**3,652,758**

## METHOD OF MANUFACTURING AN ELECTRICAL CONNECTOR

**Henri de Saint Pierre, Paris, France, assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Dec. 7, 1970, Ser. No. 95,746**
**Int. Cl. B29c 27/12; H01r 17/08**
**U.S. Cl. 264—249** **3 Claims**



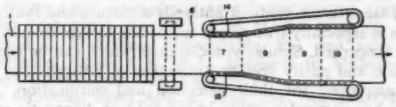
A method of manufacturing an electrical connector in which a sleeve of dielectric material is secured within a metal tube, comprising the steps of inserting a dielectric sleeve of thermo-plastics material into an open ended metal tube having an internal recess, inserting a core member into the dielectric sleeve, axially compressing the dielectric sleeve under heat to mold the dielectric sleeve between between the inside surface of the metal tube and the core member, and force dielectric sleeve material into the recess, allowing the dielectric sleeve to set, and removing the core member from within the dielectric sleeve.

**3,652,759**

## PRODUCTION OF BIAXIALLY ORIENTED POLYAMIDE FILM

**Lothar Schlemmer, Fussgonheim, Eudaldo Sabater, Hassloch, and Gerhard Kress, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany**

**Filed Jan. 8, 1970, Ser. No. 1,437**
**Claims priority, application Germany, Jan. 10, 1969, P 19 01 059.4**
**Int. Cl. B29d 7/24**
**U.S. Cl. 264—289** **3 Claims**



Improved biaxially oriented polyamide film, particularly suitable for packaging applications, may be made from amorphous film or sheeting by drawing the same in the machine direction at a draw ratio of 2.5:1 to 4:1, drawing being effected in the free paths in the gaps between non-driven draw rolls of diameter 40 to 150 mm., said free paths being less than 22 mm. long in all cases and said rolls being held at specific temperatures depending on their peripheral speeds, and then drawing the sheeting transversely at a draw ratio of 3:1 to 6:1 and at a temperature of 165 to 205° C.

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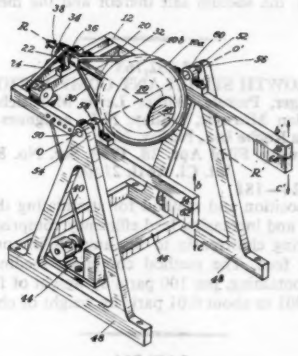
**3,652,760**

## PROCESS FOR CASTING ACRYLIC SPHERES

**Jan Petri, Pomfret, Conn., assignor to Spheres, Inc., Warminster, Pa.**

**Filed Jan. 15, 1969, Ser. No. 791,251**
**Int. Cl. B29c 5/04**
**U.S. Cl. 264—310** **4 Claims**



Method for casting thermoplastic bodies, such as acrylic spheres, involving the rotation about a first axis of a hollow mold containing a liquid charge of the thermoplastic, and the simultaneous oscillation of the mold about a second axis, substantially perpendicular to the first and parallel to the earth's horizontal, for a period of time sufficient to permit the thermoplastic to distribute itself evenly over the mold surface while solidifying, and thereby provide a hollow cast body characterized by a substantially uniform wall thickness and a configuration matching the interior surface of the mold.

3,652,761

## IMMUNOCHEMICAL COMPOSITES AND ANTIGEN OR ANTIBODY PURIFICATION THEREWITH

Howard H. Weetall, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

No Drawing. Filed Sept. 4, 1969, Ser. No. 855,376
Int. Cl. G01n *1/00, 1/34, 31/06*
U.S. Cl. 424—12 27 Claims

This invention relates to the stabilization of antigens or antibodies by chemically coupling the antigens or antibodies to an inorganic carrier by means of an intermediate silane coupling agent whereby the antigens or antibodies become insolubilized.

The isolation and purification of antibodies are necessary steps in the study of antibody structure and synthesis. This is especially true where antibodies to specific antigens are concerned. Similarly, techniques which can be used to isolate and purify specific antibodies or antigens can also be employed for their detection and purification. This area has particular utility in the field of diagnostic medicine, analytical biochemistry, and related fields.

3,652,762

## PHARMACEUTICAL COMPOSITIONS AND METHODS EMPLOYING SUBSTITUTED DERIVATIVES OF 2-ANILINOPHENYLACETIC ACIDS AND ESTERS

Alfred Sallmann, Bottmingen, and Rudolf Pfister, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Division of application Ser. No. 861,571, Sept. 29, 1969, which is a continuation-in-part of applications Ser. No. 782,206, Dec. 9, 1968, Ser. No. 782,473, Dec. 9, 1968, and Ser. No. 625,326, Mar. 23, 1967. Divided and this application Apr. 14, 1970, Ser. No. 28,507
Int. Cl. A61k *27/00*
U.S. Cl. 424—60 46 Claims

Pharmaceutical compositions containing substituted 2-anilinophenylacetic acids, their esters and salts have desirable absorption patterns for protecting the skin against the irritating effect of ultraviolet light and are also anti-inflammatory agents. Typical embodiments are compositions containing 2-(2,6-dichloroanilino)phenylacetic acid, the sodium salt thereof and the methyl ester thereof.

3,652,763

## GROWTH STIMULANT COMPOSITION

Julius Berger, Passaic, Wilbur Lewis Marusich, Wayne, and Milan Mitrovic, Nutley, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Apr. 28, 1969, Ser. No. 820,023
Int. Cl. A61k *21/00*
U.S. Cl. 424—181 4 Claims

A composition and method for stimulating the growth of poultry and increasing feed efficiency comprising orally administering chartreusin to the animals in combination with their feed. The method comprises feeding poultry a ration containing, per 100 parts by weight of feed, from about 0.0001 to about 0.01 parts by weight of chartreusin.

3,652,764

## ANTIMICROBIAL COMPOSITIONS AND METHODS OF USE

Vincent Lamberti, Upper Saddle River, N.J., and Henry Lemaire, Westport, Conn., assignors to Lever Brothers Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 502,299, Oct. 22, 1965, now Patent No. 3,427,248. This application Nov. 14, 1968, Ser. No. 775,960
The portion of the term of the patent subsequent to Feb. 11, 1986, has been disclaimed
Int. Cl. A01n *9/00, 9/12, 9/14*
U.S. Cl. 424—235 15 Claims

The specification is concerned with an antimicrobial agent which is a polyolether, polyolpolyether or sulfur analog thereof. It is also concerned with a composition containing these antimicrobial agents.

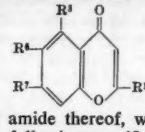
3,652,765

## PHARMACEUTICAL COMPOSITIONS AND METHODS FOR THE TREATMENT OF ALLERGIC ASTHMA

Gwynn Pennant Ellis, Heath, Cardiff, Wales, and Arthur Hedley Wragg, Middlewich, England, assignors to Fisons Pharmaceuticals Limited, Loughborough, Leicestershire, England

No Drawing. Continuation-in-part of application Ser. No. 643,352, June 5, 1967, which is a continuation-in-part of application Ser. No. 300,901, Aug. 8, 1963. This application Oct. 9, 1969, Ser. No. 865,160
Claims priority, application Great Britain, Aug. 18, 1962, 31,797/62
Int. Cl. A61k *27/00*
U.S. Cl. 424—282 14 Claims

Pharmaceutical compositions which are useful in the treatment of asthma and the like contain, as active ingredient, a chromone derivative of the formula:



or a salt, ester or amide thereof, wherein the variables are defined in the following specification, for example:

6-propoxychromone-2-carboxylic acid;
6,7-methylenedioxychromone-2-carboxylic acid;
cyclopento[g]chromone-2-carboxylic acid; and
5,6-benzochromone-2-carboxylic acid.

3,652,766

## PROCESS FOR COMBATTING BACTERIA AND FUNGI BY USING AMIDINOUREAS AND AMIDINOTHIOUREAS

Royal A. Cutler, Sand Lake, and Samuel Schalit, Albany, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 556,897, June 13, 1966, which is a continuation-in-part of application Ser. No. 462,077, June 7, 1965, both now abandoned. This application Aug. 5, 1968, Ser. No. 749,986
Int. Cl. A01n *9/12*
U.S. Cl. 424—322 14 Claims

Antibacterial and antifungal mono- and disubstituted amidinoureas and amidinothioureas are obtained by interaction of guanidines and isocyanates or isothiocyanates.

3,652,767

## GERMICIDAL COMPOSITIONS

Eric Jungermann, Chicago, David Taber, Evanston, and Leo A. Raphaelian, Wilmette, Ill., assignors to Armour-Dial, Inc., Chicago, Ill.

Filed June 30, 1969, Ser. No. 837,488
Int. Cl. C11d *3/48;* A01n *9/12*
U.S. Cl. 424—322 4 Claims

Compositions possessing antibacterial activity through the use of a synergistic mixture of hexachlorophene, triclocarban and halogen substituted phenyl 2-ethylhexyl-1-ureas.

3,652,768

## ANTISEPTIC COMPOSITIONS

Eric Jungermann, 336 Wellington Ave., Chicago, Ill. 60657; David Taber, 2000 Lincoln, Evanston, Ill. 60201; and Leo A. Raphaelian, 2640 Laurel Lane, Wilmette, Ill. 60091

Filed June 30, 1969, Ser. No. 837,489
Int. Cl. C11d *3/48;* A01n *9/12*
U.S. Cl. 424—322 4 Claims

Compositions possessing antibacterial activity through the use of a synergistic mixture of hexachlorophene and halogen substituted phenyl 2-ethylhexyl-1-ureas.

3,652,769

## CYCLOALKYLAMINES IN THE TREATMENT OF MENTAL DISORDERS INVOLVING DEPRESSION AND COMPOSITIONS THEREFOR

Walfred S. Saari, Lansdale, Pa., assignor to Merck & Co., Rahway, N.J.

No Drawing. Filed Oct. 1, 1969, Ser. No. 862,943
Int. Cl. A61k *27/00*
U.S. Cl. 424—325 13 Claims

A method for the treatment of depression comprising the administration of substituted cyclopentyl, cyclohexyl and cycloheptylamine compounds is disclosed. These compounds also exhibit a highly desirable degree of stimulation on the central nervous system. The preparation of pharmaceutical compositions containing these cycloalkylamines is also described.

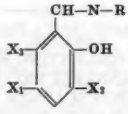
3,652,770

## COMBATTING PHYTOPATHOGENIC FUNGI ON PLANTS WITH SUB-PHYTOTOXIC FUNGICIDALLY EFFECTIVE AMOUNTS OF HERBICIDAL OXIMES OF 3,5-DIHALOSALICYLALDEHYDE

Otto Rohr, Therwil, Ludwig Ebner, Stein Aargau, Volker Dittrich, Basel, and Heinz Siegel, Binningen, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Continuation of application Ser. No. 677,760, Oct. 24, 1967. This application Apr. 1, 1970, Ser. No. 31,868
Claims priority, application Switzerland, Oct. 28, 1966, 15,711/66
Int. Cl. A01n *9/24;* A61k *27/00;* A611 *13/00*
U.S. Cl. 424—327 3 Claims

A preparation for combating harmful insects, acarides, nematodes phytopathogenic fungi and bacteria, which comprises, as active substance, a compound of general formula




wherein $X_1$ and $X_2$ represent halogen atoms, $X_3$ represents a hydrogen or a halogen atom and R represents the hydroxyl group or an aryl or an aralkyl residue which is substituted by at least one member selected from the group consisting of a halogen atom, the $CF_3$, $NO_2$, CN, alkyl, alkoxy, SCN and a tertiary amino group, together with a carrier. If desired, there may be present one or more of the following additives: a carrier, a solvent, a diluent, a dispersing agent, a wetting agent, an adhesive, a fertiliser or other pesticides.

3,652,771

## QUATERNARY AMMONIUM COMPOUNDS USED TO CONTROL BACTERIA IN HARD WATER

Reginald L. Wakeman, Philadelphia, Pa., and John J. Merianos, Jersey City, N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

No Drawing. Filed Aug. 1, 1969, Ser. No. 846,970
Int. Cl. A01n *9/20*
U.S. Cl. 424—329 3 Claims

The mixture of dodecyl dimethyl 2,4,6-trimethylbenzyl ammonium chlorides or bromides with tetradecyl dimethyl 2,4,6-trimethylbenzyl ammonium chlorides or bromides form a synergistic blend having a higher degree of microbiocidal activity in hard water than either compound by itself.

3,652,772

## 2-HYDROXY-3-METHOXY-β-NITROSTYRENE AND 2-HYDROXY - 5 - β-NITROSTYRENE AS ANTIFUNGAL AND ANTIBACTERIAL AGENTS

Glentworth Lamb, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Jan. 6, 1969, Ser. No. 789,386
Int. Cl. A01n *9/20*
U.S. Cl. 424—340 8 Claims

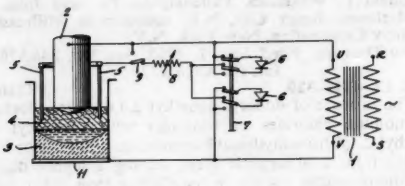
A novel method for protecting growing plants from attack by plant pathogenic fungi is given whereby an effective amount of a compound selected from the group consisting of 2-hydroxy-3-methoxy-beta-nitrostyrene and 2-hydroxy-5-methoxy-beta-nitrostyrene is applied to said plants.

# ELECTRICAL

## 3,652,773
## PROCESS OF ELECTRICALLY REMELTING HIGH-MELTING METALS

Wolfgang Holzgruber, Peter Junnergasse 16, A8605, Kapfenberg, and Peter Machner, Mullgasse 7, A8700, Leoben, both of Austria

Original application Oct. 18, 1967, Ser. No. 676,094, now Patent No. 3,571,475. Divided and this application May 28, 1970, Ser. No. 41,177
Int. Cl. H05b *3/60*
U.S. Cl. 13—9 7 Claims

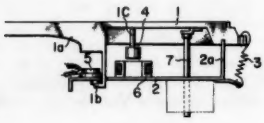


High-melting point solid metal is maintained immersed in an electrically conduction, electrolysable slag and is melted to form and maintain a pool of molten metal under said slag. An auxiliary electrode is maintained immersed in said slag. Unidirectional electric current is conducted through said auxiliary electrode and through said slag to induce fusion electrolysis in said slag so as to control ionic chemical reactions in a predetermined polarity direction taking place in said slag.

## 3,652,774
## KEYING SYSTEM FOR ELECTRONIC MUSICAL INSTRUMENTS

Junji Ohno, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamtsu-shi, Shizuoka-ken, Japan

Filed Oct. 15, 1970, Ser. No. 80,937
Claims priority, application Japan, Oct. 16, 1969, 44/82723
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.24 22 Claims

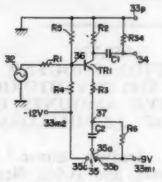


In an electronic musical instrument having playing keys of a keyboard and associated keyer circuits, the effect of double-control can be obtained by the provision of a keying system including first and second keyer controllers provided for each key to control the respective keyers. The first keyer controller is operative for normal key depression stroke prior to the key's lowest position, while the second keyer controller is responsive to a depressing force applied to the key during its stay at the lowermost end of its stroke.

## 3,652,775
## PERCUSSION KEYER FOR AN ELECTRONIC MUSICAL INSTRUMENT

Takeshi Adachi, and Takatosi Okumura, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed June 23, 1970, Ser. No. 49,053
Claims priority, application Japan, June 25, 1969, 44/49914; Sept. 3, 1969, 44/69583
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.26 11 Claims

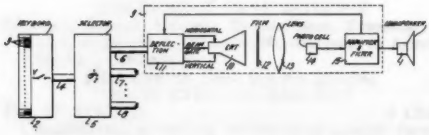


In an electronic musical instrument having a plurality of selectively operable keys associated with key switches and keyer circuits; a keyer circuit is turned ON to give out a tone signal by a trigger voltage derived from the key switch through a series-interposed capacitor and is subsequently turned OFF gradually by the charging operation of the capacitor. When the key switch is at a rest state, the capacitor is connected with a discharging route to prepare for the next operation of the key switch.

## 3,652,776
## APPARATUS FOR SIMULATING MUSICAL SOUND EMPLOYING A SCANNABLE RECORD AND FLYING SPOT SCANNER

Karl F. Milde, Jr., 198 Baltic St., Brooklyn, N.Y.

Continuation-in-part of application Ser. No. 2,032, Jan. 12, 1970, now abandoned. This application July 13, 1970, Ser. No. 54,448
Int. Cl. G10h *3/04*
U.S. Cl. 84—1.28 17 Claims



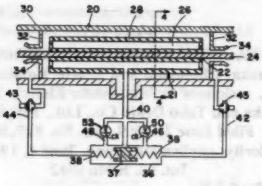
Apparatus for simulating the sounds of a musical instrument. The apparatus includes an input device, such as keyboard, for producing signals determinative of the pitch of the notes to be played and an output device, connected to the input device, for producing notes simulating a musical instrument at the determined pitch. The simulation of the musical instrument is achieved by providing a record of the attack transient, the steady state characteristic and the decay transient of a plurality of musical notes and by reading first the attack transient, then the steady state and finally the decay transient of selected ones of these notes upon receipt of a signal or signals from the input device.

3,652,777

## AUTOMATIC STOP JOINT FOR PIPE-TYPE CABLE

James H. Elliott, Columbus, Ohio, assignor to Electrical Constructors and Associates, Columbus, Ohio

Filed Mar. 16, 1970, Ser. No. 19,978
Int. Cl. H02g 15/20
U.S. Cl. 174—11 R 4 Claims



An automatic stop joint for a pipe-type electrical cable characterized by a stop gland means mounted between adjacent portions of the cable and the inner wall of the conduit carrying the cable. The stop gland means includes an expandable chamber and moveable wall means which are automatically activated to move between sealing and nonsealing relationship with the cable and conduit portions responsive to the occurrence of a pressure differential across the stop joint and a subsequent dissipation of that pressure differential.

## ERRATUM

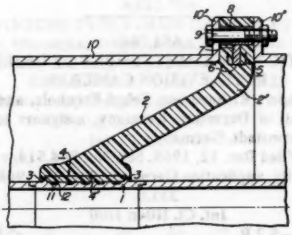
For Class 174—15 see:
Patent No. 3,652,797

3,652,778

## INSULATING SPACER

Yoshikazu Sakai, Kagamihara, Japan, assignor to NGK Insulators, Ltd., Mizuho-ku, Kagoya, Japan

Filed Oct. 6, 1970, Ser. No. 78,373
Claims priority, application Japan, Oct. 16, 1969, 44/98379
Int. Cl. H01b 9/04
U.S. Cl. 174—28 3 Claims



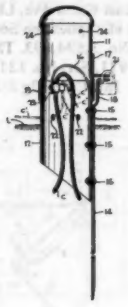
An insulating spacer comprising a central conductor, a cylindrically shaped metallic shield which is arranged around said central conductor and is partially in contact with said central conductor, an insulating member made of a thermosetting resin said shield is embedded into the inner diameter thereof and said central conductor is enclosed thereby, and a shield of the earth side which is deeply embedded into a outwardly extending flange portion of said insulating member, and also preferably comprises fiber-reinforced resin formed of fibrous tissues which is tightly wound around a plurality of independent grooves provided on the periphery of said central conductor and a thermosetting resin which is infiltrated into said fibrous tissues so that said insulating member formed of a thermosetting resin may be firmly fixed around over said central conductor, thus said insulating spacer being adapted to be applied to a duct line air power transmission bus bar, gas-filled breaker or the like in which a sulfur hexafluoride gas is employed as an insulating medium.

3,652,779

## UNDERGROUND CABLE PEDESTAL

Kenneth D. Grinols, 5354 Calle Florida, Siesta Key, Sarasota, Fla.

Filed Apr. 21, 1971, Ser. No. 135,940
Int. Cl. H02g 9/02
U.S. Cl. 174—38 5 Claims



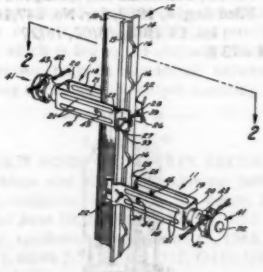
An underground cable pedestal comprising a lower tubular section partially embedded in the ground and having a grounding bar secured thereto as well as a grounding strap. A slideably removable cover section is provided for closing the top of the lower section; mating locking flanges being provided on both the cover and grounding bar to facilitate locking of the cover.

3,652,780

## REVERSIBLY MOUNTABLE INSULATOR

Robert M. Wilson, Battle Creek, Mich., assignor to Dare Products, Incorporated, Battle Creek, Mich.

Filed Oct. 30, 1970, Ser. No. 85,494
Int. Cl. H01b 17/16; A01k 3/00
U.S. Cl. 174—45 R 7 Claims



An insulator assembly is provided adapted to be mounted on an electric fence post and to support electrically charged wire. The insulator is provided with a long extender body adapted to support the electrically charged wire in a position wherein it is spaced apart from the fence post a substantial distance. The base of the insulator assembly is provided with a clip adapted to engage laterally extending flanges of the fence post, as for example, the laterally extending flanges of

a steel fence post having a T-shaped cross section. Apertures are provided in the extender body immediately adjacent the base clip to receive a cotter pin or other means for clamping the jaws of the clip together on the fence post, when the insulator is so mounted that the extender is directed outboard of the fence post. Additionally, longitudinally extended flanges are provided in the base clip and provided with apertures to receive a cotter pin or similar means for clamping the jaws together when the extender body is positioned inboard of the flanges of the fence post.

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**3,652,781**

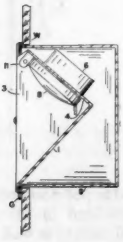
**RECESSED WATERPROOF ELECTRICAL CONNECTION BOX COVER**

**Alfred Robbins, 80 East Gates Ave, Lindenhurst, N.Y.**

**Continuation-in-part of application Ser. No. 887,276, Dec. 22, 1969, now Patent No. 3,594,693. This application Apr. 7, 1971, Ser. No. 131,887**

**Int. Cl. H02g** *3/14*

**U.S. Cl. 174—67** **4 Claims**



A wall recessed outdoor electrical connection box cover which is protected against rain and snow. The recessed face of the cover containing the electrical socket is angled down at a substantial angle and is recessed in the wall to protect the face from rain and snow. Snap type caps are mounted over the electrical socket or sockets.

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**3,652,782**

**STRESS RELIEF APPARATUS FOR CABLE CONNECTION**

**Hisatomo Furusawa; Kazuyoshi Inaoka, and Masahiro Maruyama, all of c/o Furukawa Denki Kogyo Kabushiki Kaisha, Yokohama Densen Seizosho, No. 6-1, Nishihiranuma-cho, Nishi-ku, Yokohama-shi, Kanagawa-ken, Japan**

**Filed Aug. 4, 1969, Ser. No. 847,161**

**Int. Cl. H02g** *15/02, 15/22*

**U.S. Cl. 174—73 R** **3 Claims**

A tubular body made of an elastomer has conical surfaces at both ends and an axial bore to receive the cable insulation of a sheathed cable, and is provided with a conductive stress cone.

A solid support cylinder made of an insulating material has a stress relief electrode embedded therein and exerts an axial compression on the tubular body in cooperation with a clamping member. Owing to the compression, the tubular body is brought into intimate contact with the cable insulation. The arrangement of the stress relief electrode in the support cylinder is such that it comes on an extension of the conical surface of the stress cone. The stress relief electrode is grounded.

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**3,652,783**

**COLOR FACSIMILE SYNCHRONIZATION SYSTEM**

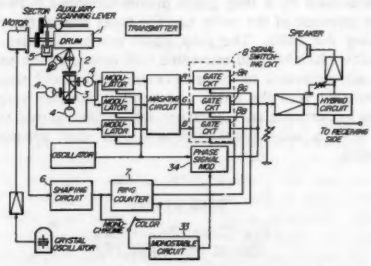
**Yutaka Tanaka, Chofu-shi, and Koichi Kobitsu, Tokyo, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka and Toho Denki Co., Ltd., Tokyo, Japan**

**Filed June 2, 1969, Ser. No. 829,382**

**Claims priority, application Japan, June 4, 1968, 43/38935**

**Int. Cl. H04n** *9/42*

**U.S. Cl. 178—5.2 R** **4 Claims**




This invention relates to a color facsimile synchronization system employed in a color facsimile system for transmitting a colored original in line sequence and reproducing the original in color at a receiving apparatus. The color facsimile synchronization system includes means for simultaneously effecting color and phase synchronization between both transmitting and receiving apparatus, synchronization being accomplished in the receiving apparatus by means of a phase signal generated in and transmitted from the transmitting apparatus. This invention also discloses an electronic circuit for electronically switching color signals which are transmitted in line sequence by the transmitting apparatus.

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**3,652,784**

**AUTOMATIC RANGE ADJUSTMENT OF OBJECTIVES IN TELEVISION CAMERAS**

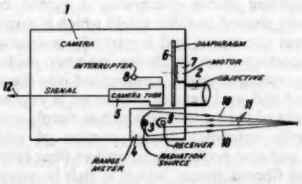
**Max E. Wupper; Richard von Felgel-Farnholz, and Dietmar Gornott, all of Darmstat, Germany, assignors to Fernseh GmbH, Darmstadt, Germany**

**Filed Dec. 12, 1969, Ser. No. 884,514**

**Claims priority, application Germany, Dec. 21, 1968, P 18 16 331.0**

**Int. Cl. H04n** *1/00*

**U.S. Cl. 178—5.2 R** **14 Claims**




A modulated light source and a receiver determine range of scenes to be photographed. Preferably, ranging is accomplished during vertical flyback so that ranging light rays do

not interfere with the ambient light reception and control signals do not interfere with camera electronics. Physical or electronic means are employed to ensure camera insensitivity during ranging.

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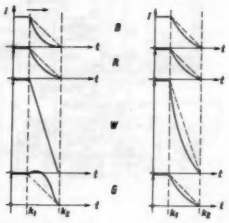
3,652,785

## ARRANGEMENT FOR SUPPRESSING FRINGE EFFECTS IN COLOR TELEVISION CAMERAS

Hans-Dieter Schneider, Gross-Gerau, Germany, assignor to Fernseh GmbH, Darmstadt, Germany

Filed May 14, 1970, Ser. No. 37,268
Claims priority, application Germany, May 16, 1969, P 19 24 911.1
Int. Cl. H04n 9/04
U.S. Cl. 178—5.4 R 10 Claims



An arrangement in which fringe effects associated with moving objects in color television cameras, are suppressed. The camera tubes are provided with scanning beams of low velocity electrons, and their beam current intensities are adjusted so that the resulting intensities exceed that intensity of the beam current required for discharge of the target at a predetermined brightness level. The beam current intensities are adjusted so that the inertia characteristics of the tubes which determine the fringe effects, become equalized among the tubes. A linear matrix connected to the outputs of the camera tubes combine the output signals in the required manner. Limiting elements connected to the inputs of the matrix limit the signal levels from the tubes to substantially the maximum level of the camera tube with the smallest beam current.

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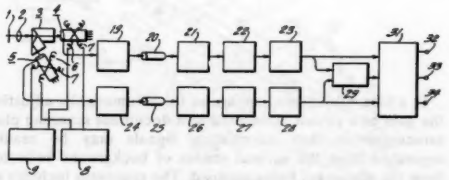
3,652,786

## TWO-TUBE TYPE COLOR CAMERA SYSTEM

Masanobu Morishita, Tokyo, Japan, assignor to Nippon Electric Company Limited, Tokyo, Japan

Filed Oct. 8, 1970, Ser. No. 79,023
Claims priority, application Japan, Oct. 13, 1969, 44/81999; Aug. 7, 1970, 45/69627
Int. Cl. H04n 9/08
U.S. Cl. 178—5.4 R 5 Claims



A color TV system in which reflected light from the object is split into short and long wavelength components which are then scanned in the conventional manner by TV camera tubes. The long and short wavelength components are selected so as to at least partially overlap one another. The scanned signals generated by the camera tubes, after undergoing noise removal and compensation to correct for frequency deterioration and attenuation, are combined in a multiplier circuit to form a signal representative of the product of the two input signals. The product signal is then combined with the short and long wavelength signals in a matrix circuit where the signals are combined in three different predetermined manners to form resultant output signals representative of the red, green and blue component signals, thus enabling the generation of the three primary color signal through the use of only a two-tube system.

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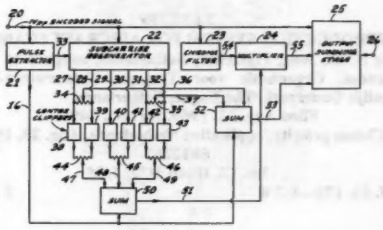
3,652,787

## TELEVISION SIGNAL COLOR CORRECTOR

Katarina Tkacenko, 2305 East 2nd St., Bloomington, Ind.

Filed Nov. 12, 1970, Ser. No. 88,727
Int. Cl. H04n 9/00
U.S. Cl. 178—5.4 R 5 Claims



A television signal color corrector operable to correct the signal without demodulation. A pulse extractor, subcarrier regenerator, chroma filter, multiplier and output summing stage are connected together to receive the incoming encoded composite color signal. The pulse extractor provides a burst flag pulse to the subcarrier regenerator which has six outputs corresponding to the phase of color chrominance of red, blue, green and their complementaries. Center clippers are connected to the outputs of the regenerator and remove the center portion of the subcarrier regenerator output signals. Three potentiometers receive the outputs from the center clippers and allow adjustment of the red, blue and green signals. A summing stage is connected to the three potentiometers and receives a blanking pulse from the pulse extractor and provides the correcting color signal to an electronic multiplier connected to the output of the chroma filter. The output of the multiplier is fed to an output summing stage which provides the corrected signal. Two potentiometers connected each between two of the subcarrier regenerator outputs are adjustable to provide a black balance signal which is fed to the output summing stage. A gamma compressor may be connected between a black balance summing circuit and the output summing stage.

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3,652,788

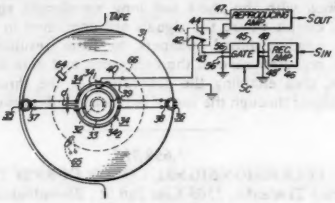
## FIELD SKIP MODE VIDEO TAPE RECORDER

Takashi Nakashima, and Kazuaki Kakinuma, both of Katsuta-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed June 10, 1969, Ser. No. 831,853
Claims priority, application Japan, June 17, 1968, 43/41361
Int. Cl. H04h 5/78; H04n 7/12; G11b 5/48
U.S. Cl. 178—6.6 SF 17 Claims

A field skip mode video tape recorder wherein a magnetic tape is transported while being slantly wound about half the periphery of two rotary magnetic heads which are connected to two sections of a halved slip ring and a brush is adapted to be alternately contacted with said two sections of the slip ring so that during the recording operation, only even fields of a video signal to be recorded may be supplied to one of the two heads, namely a recording head in synchronism with

the period during which the recording head is connected with the brush and the tape, and during the reproducing operation, output signals from the heads which alternately appear at the brush are supplied to a single playback amplifier.

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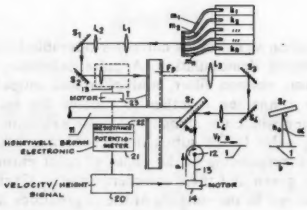
3,652,789

## REPRODUCTION SYSTEM FOR AIRCRAFT SCANNERS

Arie N. De Jong, Pijnacker, Netherlands, assignor to Nederlandse, Organisatie voor Toegepast-Natuurweten-Schappelijk Onderzoek, The Hague, Netherlands

Filed Aug. 12, 1969, Ser. No. 849,412
Claims priority, application Netherlands, Aug. 29, 1968, 6812267
Int. Cl. H04n 5/72, 5/86
U.S. Cl. 178—6.7 R 2 Claims




The invention relates to a device for filming an area scanned electronically with the aid of an aircraft.

The scanning results in a number of intensity-modulated beams of rays produced by crater lamps. Between the crater lamps and the film are provided a fiber sheet, a transmission filter and a zoom lens, the zoom position of which is coupled with the film transport, which transport itself is carried out in such a way that the film velocity is adapted to the aircraft velocity/aircraft height ratio.

The conditions of fiber sheet and transmission filter are coupled with the position of a rotating mirror for exposing the film.

Sheet and filter are provided between zoom lens and rotating mirror.

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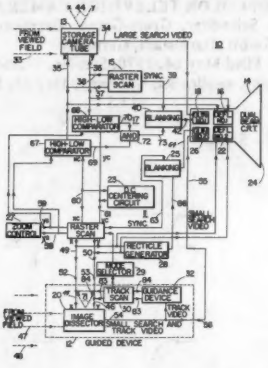
3,652,790

## SEARCH AND TRACKING TELEVISION SYSTEM AND METHOD

Edward H. Eberhardt, Fort Wayne, Ind., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 28, 1970, Ser. No. 6,630
Int. Cl. H04n 5/22, 7/18
U.S. Cl. 178—6.8 27 Claims

A search and tracking television system and method in which a storage-type camera tube is employed for searching a large field of view for a desired target, the image of the field viewed by the storage camera tube being displayed by one gun of a dual beam cathode ray tube. An image dissector-type camera tube is employed for viewing a smaller included field, and ultimately for tracking a desired target, and the image of the smaller field viewed by the image dissector tube is displayed by the other gun of the dual beam cathode ray tube. The image dissector tube is electronically and/or mechanically gimballed selectively to move the image of its field of view on the screen of the dual beam cathode ray tube




so as to display the image of a desired target which appears in the field of view of the storage camera tube in the field of the image dissector tube. Once the target image has been so displayed, the image dissector tube is switched to its tracking mode so as to track the target thus acquired in its field of view.

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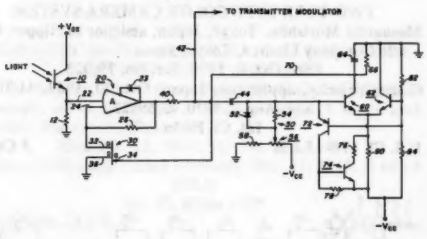
3,652,791

## CIRCUITRY FOR DISTINGUISHING BETWEEN BACKGROUND AND INTELLIGENCE AREAS ON A DOCUMENT

David R. Shuey, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of application Ser. No. 789,867, Jan. 8, 1969. This application May 6, 1970, Ser. No. 35,048
Int. Cl. H04n 5/19; H01j 39/18; H03g 3/30
U.S. Cl. 178—7.1 R 8 Claims




In a facsimile system, apparatus for automatically adjusting the gain of a circuit connected to a document scanning photoreceptor so that information signals may be readily separated from the various shades of background reflected from the document being scanned. The apparatus includes an operational amplifier, the feedback loop of which, in a first embodiment, includes a field effect transistor. The gain of the operational amplifier is adjusted so that its output is at one of two levels, representing information or background signals, by controlling the signal applied to the gate electrode of the field effect transistor. In a second embodiment the effective load resistor of the photoreceptor is varied by inter-

posing a field effect transistor between the photoreceptor and the input of the operational amplifier. The amplitude of the output signal of the operational amplifier is adjusted by controlling the signal applied to the gate electrode of the field effect transistor.

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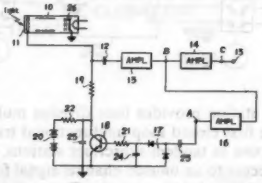
**3,652,792**

**AUTOMATIC SENSITIVITY CONTROL CIRCUIT FOR IMAGE PICKUP CAMERA**

**Koji Usagawa, Tokyo, Japan, assignor to Victor Company of Japan, Limited, Yokohama-City, Japan**

**Filed Sept. 3, 1969, Ser. No. 854,850**
**Claims priority, application Japan, Sept. 4, 1968, 43/63064**
**Int. Cl. H04n** *5/14*
**U.S. Cl. 178—7.2 R** **13 Claims**




An automatic sensitivity control circuit for image pickup camera having an amplifier provided in a control roop for controlling an output signal of a vidicon, said amplifier having a photoconductive element varying its resistance value in response to the scene illumination. By the variation of the gain of said amplifier in response to the variation of resistance value of said element, the output signal of said vidicon is controlled to small when the illumination is low and large when the illumination is high.

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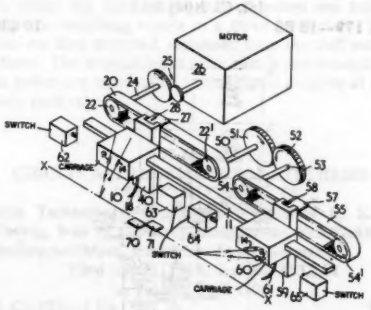
**3,652,793**

**FACSIMILE APPARATUS HAVING PLURAL RECIPROCATING SCANNING HEADS**

**Gerald Farr, Sanderstead, Surrey; Frances M. Anderson, Beckenham, Kent, and Eric Thomas Arthur Phillips, Bromley, Kent, all of England, assignors to Muirhead Limited, Beckenham, Kent, England**

**Filed Mar. 25, 1969, Ser. No. 810,111**
**Claims priority, application Great Britain, Mar. 29, 1968, 15,400/68; 15,401/68; 15,402/68**
**Int. Cl. G01d** *15/24;* **H04n** *1/14, 1/22*
**U.S. Cl. 178—7.6** **10 Claims**




Facsimile apparatus is provided with a scanning assembly which is reciprocated back and forth by a drive imparted to it from forward and return runs of at least one flexible belt loop continuously driven in one direction only by a constant speed motor. Such a drive can be cheaply and compactly manufactured and also lends itself readily to driving simultaneously and in synchronism several scanning heads which are each responsible for scanning a unique section of a line. The scanning assembly is usable in a facsimile transmitter, a facsimile receiver, or a facsimile transreceiver.

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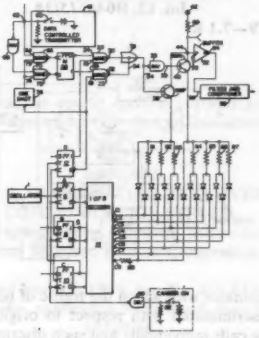
**3,652,794**

**APPARATUS AND METHOD FOR TRANSMITTING INTELLIGENCE WITH STEPPED WAVES**

**Gyorgy I. Vancsa, Newark, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Apr. 30, 1970, Ser. No. 33,429**
**Int. Cl. H04l** *27/24*
**U.S. Cl. 178—67** **9 Claims**



A fast operating phase-shift-controlled system for transmitting information in which a simulated sine wave is generated digitally and in which the phase of the generated wave is shifted solely at the 0° and 180° points to eliminate "ringing" and thereby increase the speed at which data may be transmitted.

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**3,652,795**

**TELEPHONE TRANSACTION SYSTEM**

**Arnold M. Wolf, Brooklyn, and John G. Richter, Yonkers, both of N.Y., assignors to Electrospace Corporation, Westbury, N.Y.**

**Continuation-in-part of application Ser. No. 806,446, Mar. 12, 1969, now abandoned. This application Nov. 25, 1970, Ser. No. 92,554**
**Int. Cl. H04m** *11/06*
**U.S. Cl. 179—2 DP** **7 Claims**

A system is described for buying materials or services by transferring funds in a bank from a buyer's deposit account

to a seller's account. The transfer of funds is accomplished by means of a "touch-tone" telephone receiving set equipped with a first decoding and printing means. A computer at the bank receives coded signals from the telephone set and, after decoding the signals, records the transaction at that location. Each purchaser is provided with a secret purchaser number on a telephone operating card and the entire operation is performed in the presence of the purchaser and a representative of the seller or store.

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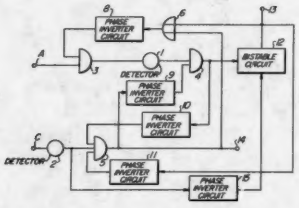
**3,652,796**

**MEANS FOR DISCRIMINATING BETWEEN ORIGINATING AND TERMINATING CALLS**

**Eiji Kezuka, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Sept. 16, 1969, Ser. No. 858,280**
**Claims priority, application Japan, Sept. 20, 1968, 43/69027**
**Int. Cl. H04m** *15/38*
**U.S. Cl. 179—7.1 R** **5 Claims**




A discriminator with which the traffic of telephone circuits may be discriminated with respect to originating calls and terminating calls individually and such discrimination may be readily accomplished without interfering with the telephone rules and regulations.

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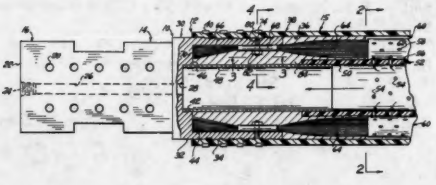
**3,652,797**

**SAFETY ANCHORED MULTICONDUCTOR CABLE FOR ELECTRIC ARC FURNACES**

**Daniel J. Goodman, 23236 Westbury Ave., St. Clair Shores, Mich.**

**Filed Aug. 13, 1970, Ser. No. 63,405**
**Int. Cl. H01b** *7/34*
**U.S. Cl. 174—15 C** **7 Claims**



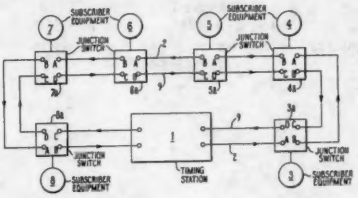
This multiconductor water-cooled electric arc furnace cable has the majority of its conductors secured within the terminal cup by means of solder. In order to prevent the conductors from dropping out of the terminal cup upon a failure of the water-cooling system causing the solder to melt, two of the conductors are additionally bolted to the inner side of the outer wall of each of the terminal cups. This bolted anchorage prevents the cable from leaving the terminal cup and dropping upon melting of the solder and provides the maximum space for the largest possible central tubular cooling water conduit. It consequently prevents serious damage to the furnace or surroundings and possible injury or deaths of workmen resulting from their coming into contact with the high-voltage high-amperage current thus released, since the conductors still remain connected to the transformer.

**3,652,798**

**TELECOMMUNICATION SYSTEM**

**Joseph Hood McNeilly, Harlow, and Ryszard Kitajewski, Nazeing, both of England, assignors to International Standard Electric Corporation, New York, N.Y.**

**Filed June 8, 1970, Ser. No. 44,396**
**Claims priority, application Great Britain, July 28, 1969, 37,764/69**
**Int. Cl. H04j** *3/00*
**U.S. Cl. 179—15 AL** **9 Claims**




A timing station provides time division multiplex channel signals on a first closed loop unidirectional transmission line interconnective in tandem subscriber stations, each of which may gain access to an unused channel signal for communication with an idle subscriber station. To protect against failure of the entire system due to a break in the line or failure in one of the subscriber stations, a second closed loop unidirectional transmission line is connected to all stations transmitting signals in a direction opposite to that on the first line. Each subscriber station can detect an error and transfer the communication signals on the first line to the second line. The subscriber station before the break transfers the communication signal to the second line and the subscriber station after the break transfers the communication signals back to the first line to form a new, but continuous closed loop. When communication signals are on the second line and a fault occurs, the transfer of communication signals will be similarly performed to provide still another new, but continuous closed loop by passing the fault. Two embodiments to detect a fault and control the transfer of communication between the two lines are disclosed.

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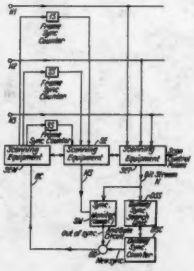
**3,652,799**

**FRAME SYNCHRONIZATION SYSTEM**

**David M. Thomas, Bayshore, Ottawa, Canada, assignor to International Standard Electric Corporation, New York, N.Y.**

**Filed Sept. 29, 1970, Ser. No. 76,407**
**Claims priority, application Great Britain, Sept. 30, 1969, 48,096/69**
**Int. Cl. H04j** *3/06*
**U.S. Cl. 179—15 BS** **10 Claims**



An incoming TDM bit stream, containing synchronization signals in one or more time positions of each TDM frame is

monitored by a first circuit to test the stream synchronization signal versus local synchronization signal. While this is in progress a second circuit looks for the stream synchronization signal in bit stream. If the first circuit shows that synchronization is O.K., then there is no change. However, if the first circuit shows that synchronization is lost, then the synchronization signal detected by the second circuit is used as a new local synchronization signal. The concurrent operation of the first and second circuit enables rapid resynchronization when synchronization is lost.

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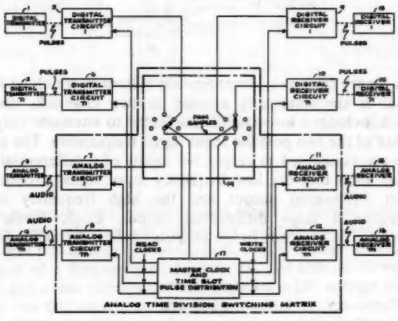
**3,652,800**

## DIGITAL PULSE TRANSMISSION THROUGH AN ANALOG TDM SWITCHING SYSTEM

**Gerald F. Dooley, Galion, Ohio, assignor to North Electric Company, Galion, Ohio**

**Filed May 27, 1970, Ser. No. 40,826**
**Int. Cl. H04j** *3/06*
**U.S. Cl. 179—15 BA** **15 Claims**




A time division multiplex switching system for transmission of digital pulses from asynchronous pulse transmitters in which each incoming data stream is buffered until the occurrence of an assigned time slot. During such assigned time slot, either the data pulses or stuff pulses are transmitted across the switching matrix in a three level code. The data pulses are then detected, separated from the stuff pulses, and buffered. The original input pulse rate is regenerated and the data pulses are transmitted to the digital receiver at approximately such rate.

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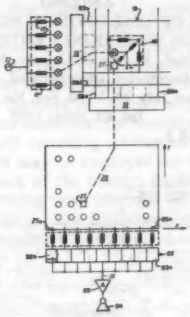
**3,652,801**

## CIRCUIT ARRANGEMENT FOR SYNTHESIS OF ACOUSTIC ELEMENTS

**Walter Tscheschner, Dresden, and Siegfried H. E. Fuchs, Coswig, both of Germany, assignors to Veb Elektronische Rechenmaschinen, Karl-Marx-Stadt, Germany**

**Filed Apr. 7, 1969, Ser. No. 813,948**
**Int. Cl. G10l** *1/00*
**U.S. Cl. 179—1 SA** **3 Claims**

The artificial speech initiating electrical signal is in the form of periodic triangular vibrations or of a noise signal. The signal is selectively applied through a coordinate control matrix to input or excitation points of a conventional speech synthetizing potential field device which distributes the potentials of the signal along a number of output electrodes. Each of the electrodes is connected with a band-pass filter,



respectively, and the output spectral portions are combined into the shaped spectrum of the desired articulated sound.

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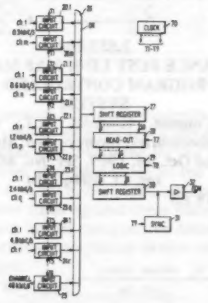
**3,652,802**

## METHOD OF TRANSMITTING DATA OVER A PCM COMMUNICATION SYSTEM

**Arnold Albert Schellenberg, Wettswil, Switzerland, assignor to International Standard Electric Corporation, New York, N.Y.**

**Filed Nov. 14, 1969, Ser. No. 876,645**
**Claims priority, application Switzerland, Dec. 11, 1968, 18449/68**
**Int. Cl. H04j** *3/06*
**U.S. Cl. 179—15 BS** **6 Claims**



Either one data channel having a high data rate, or several data channels of the same or mixed lower data rate or rates are transmitted in a channel of a TDM-PCM system having a high data rate. The data transmission is performed in synchronism with the PCM system. This is accomplished by having the data frame of the lower data rates related by a multiple to the PCM frame and by adding bits to the data code words to cause equality between the bits of the data code words and the bits of the PCM code words. Further the data is stored in a buffer store, where the bit addition is accomplished, and is read out continuously in the proper channel time slot of the PCM system. To protect against false data frame synchronization due to data code words simulating the data frame synchronization signal, the added bits of certain of the data code words are employed to form a data frame synchronization code word. It is taught herein that conversion from binary coded bits to binary coded ternary code

words provides an advantage in transmission of data in a PCM system.

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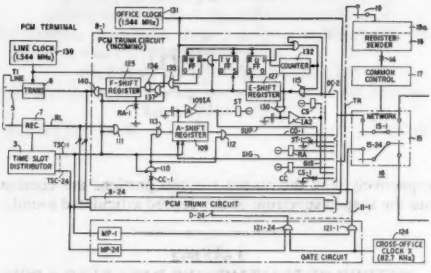
**3,652,803**

## SWITCHING OF TIME DIVISION MULTIPLEX LINES THROUGH TELEPHONE CENTRAL OFFICES

**Amos Edward Joel, Jr., South Orange, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed July 30, 1970, Ser. No. 59,532**
**Int. Cl. H04j 3/00**
**U.S. Cl. 179—18 J** **9 Claims**




The communications channels or time slots of time division multiplex lines are enabled to be switched through a conventional common control telephone switching office by providing each line with a plurality of digital trunks, one for each time slot in a frame, extracting call signaling information from the time slots and establishing cross-office connections for each digital trunk. To avoid excessive crosstalk, the contents of each time slot, registered in its respective digital trunk, is outpulsed cross-office at a pulse repetition rate less than the characteristic rate of the time division multiplex line but in a time interval substantially less than the interval occupied by a complete frame of time slots.

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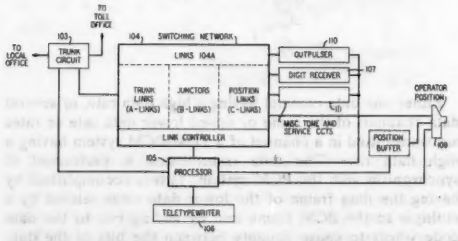
**3,652,804**

## MAINTENANCE BUSY LINK MAP MARKING IN A STORED PROGRAM CONTROLLED SWITCHING SYSTEM

**William K. Comella, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Oct. 24, 1969, Ser. No. 869,122**
**Int. Cl. H04q 3/54**
**U.S. Cl. 179—18 ES** **12 Claims**




A stored program processor controlled switching system is disclosed wherein links of the switching network are busied for both maintenance and communication purposes. The busy or idle state of a link is recorded in a processor link map. A separate maintenance map records the particular links which are busy for maintenance purposes. When a link is made maintenance busy, a link map work defining a link group containing that link is marked with an index to a maintenance map word which contains information as to which link of the link group is maintenance busy. An audit program periodically checks the link map with the actual communication paths through the network and is directed to the proper maintenance map word so that it can reconcile discrepancies between the link map and the communication paths through the network.

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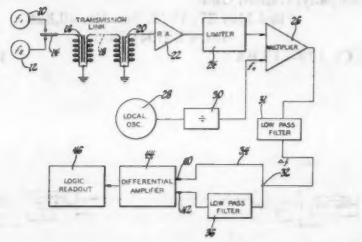
**3,652,805**

## BINARY FREQUENCY IDENTIFICATION SYSTEM

**Daniel A. Wisner, Detroit, Mich., assignor to Information Control Systems, Inc., Ann Arbor, Mich.**

**Filed Oct. 10, 1969, Ser. No. 865,354**
**Int. Cl. H04m 1/50**
**U.S. Cl. 179—84 VF** **7 Claims**




A binary frequency identification system in which an input signal is simultaneously applied to two channels, one of which includes a low-pass filter selected to attenuate only the higher of the two possible input signal frequencies. The channels are connected to respective inputs of a differential amplifier such that the low frequency input signal produces a small differential output and the high frequency signal produces a large differential output. Logic levels are generated in response to the outputs of the differential amplifier.

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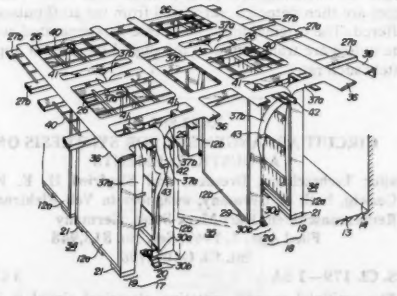
**3,652,806**

## TRANSPORTABLE TELEPHONE EXCHANGE APPARATUS

**Norihiko Nakagami, Matsuyama-shi; Yasuyuki Tanaka; Katsuhiro Kotaka, and Masamitsu Seki, all of Yokohama, Japan, assignors to Hitachi, Ltd. and Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan**

**Filed July 11, 1968, Ser. No. 744,003**
**Claims priority, application Japan, July 14, 1967, 42/45037**
**Int. Cl. H04m 1/00**
**U.S. Cl. 179—99** **1 Claim**



A transportable telephone exchange apparatus that can be moved to a district to deal with a temporary shortage of subscriber lines in that district. In the apparatus, a row of stationary bays and a row of movable bays are arranged in a

back-to-back relationship with each other to form a bay block, and there are at least two bay blocks in which the movable bays in the different rows face each other while the stationary bays face the side walls of the casing of the apparatus so as to define at least two maintenance passages of sufficient width within the apparatus.

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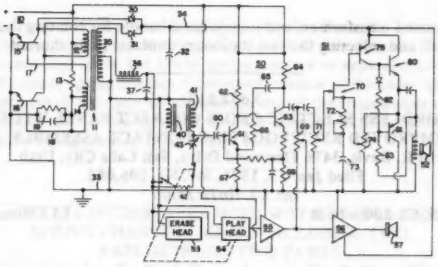
**3,652,807**

## MAGNETIC TAPE RECORDING AND PLAYBACK SYSTEM DESIGNED FOR LOW VOLTAGE DC POWER SOURCES

**Robert A. Kusich, Walnut Creek, Calif., assignor to Wesley C. Keys; Wesley G. Schirman; Milton C. Johnson and Audio Research Manufacturing Co., San Francisco, Calif.**

**Filed Apr. 2, 1970, Ser. No. 25,071**
**Int. Cl. G11b** *5/44*
**U.S. Cl. 179—100.2 R** **8 Claims**




A magnetic tape recording and playback system designed to be powered from low voltage DC sources includes its own integral power supply that supplies a high voltage alternating output of a frequency of 30 kHz. to 100 kHz. to drive the bias and erase circuits and also supplies a DC voltage higher than the DC source voltage for powering the pre-amplifiers and power amplifiers in the system. It is particularly adaptable to systems employing integrated circuits (ICs) in the amplifier circuits, such as are now being sold for installation in automobiles.

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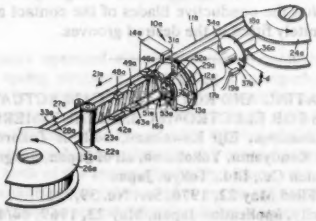
**3,652,808**

## APPARATUS AND METHOD FOR REVERSE RECORDING A MASTER TAPE FOR CONTACT DUPLICATION OF MAGNETIC TAPES

**Daniel David Esterly, Fremont, and Larry Michael Jacob, Redwood City, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.**

**Filed Nov. 20, 1969, Ser. No. 878,512**
**Int. Cl. G11b** *5/86, 15/44*
**U.S. Cl. 179—100.2 E** **13 Claims**



In a wideband, transverse scan magnetic tape recording system, such as used for video signals, a standard transport is modified for recording high resolution and magnetically durable master tapes to be used in making multiple copies thereof by a contact duplicating process in which a blank tape is brought into face-to-face contact with the master tape. In particular, the transport for recording the master tape is arranged to record the transverse magnetic tracks in a pattern having a reflected or mirror image relationship with the tracking format carried by tapes adapted for playback on a standard transverse scan transport. The contact duplicate of the master thus receives the proper magnetic image for playback on standard machines. The modifications which are made to the standard recording mechanism are such that a single transport unit may be employed for recording of the master tape, playback of the contact duplicate tapes made therefrom, or recording and playback of other standard tapes, by interchanging a few component parts and making certain minor adjustments to the standard unit depending on the desired use.

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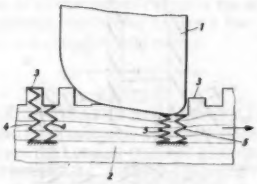
**3,652,809**

## SYSTEM FOR REPRODUCING MECHANICALLY STORED SIGNALS INCLUDING CARRIER HAVING DEFORMABLE MEANS COACTING WITH PRESSURE-SENSITIVE PICKUP MEANS

**Gerhard Dickopp; Hans-Joachim Klemp; Horst Redlich, and Eduard Schuller, all of Berlin, Germany, assignors to Telefunken G.m.b.H., Berlin and Teldec Telefunken-Decca Schallplatten G.m.b.H., Hamburg, Germany**

**Filed Feb. 12, 1969, Ser. No. 798,709**
**Claims priority, application Germany, Feb. 13, 1968, P 15 74 489.5**
**Int. Cl. G11b** *3/10;* **H04r** *15/00, 17/00*
**U.S. Cl. 179—100.4 R** **25 Claims**



Apparatus for reproducing a mechanically recorded signal which includes a storage element and a signal pickup device. The signal is mechanically recorded on the storage element by means of a series of deformations in the surface thereof. According to the invention, the pickup device is arranged to apply a compressive force against these deformations and to sense the variations in this compressive force resulting from relative motion between the pickup device and the surface of the storage element.

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**3,652,810**

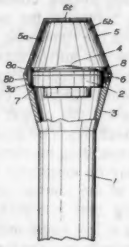
## MICROPHONE HAVING A PROTECTIVE CAP

**Bernhard Weingartner, Mauerberg, Austria, assignor to Akustische U. Kino-Gerate Gesellschaft m.b.H., Vienna, Austria**

**Continuation of application Ser. No. 542,419, Apr. 13, 1966, now abandoned. This application May 1, 1970, Ser. No. 31,863**
**Claims priority, application Austria, Apr. 23, 1965, A3742/65**
**Int. Cl. H04r** *1/08*
**U.S. Cl. 179—184** **9 Claims**

A microphone includes a microphone housing having a sound transducer therein. A cover of substantially cup-shaped configuration fits over one end of the housing above the transducer and it is made of a material which comprises a plurality of particles which are sintered together or fused together in a manner to define tortuous passages therebetween and to define hollow spaces remaining between

the particles, and which hollow spaces are interconnected, thus forming irregular channels which assure the sound permeability of the cap but are impenetrable by dust or other air pollutants.



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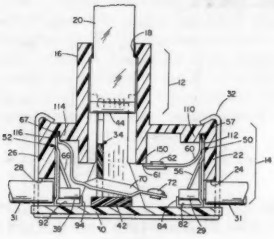
**3,652,811**

## LAMINATED LOCKING SLIDER MULTIPLE CIRCUIT PUSHBUTTON SWITCH ASSEMBLY WITH IMPROVED CONNECTORS FOR PLUG-IN WIRES

**Charles Azel Barney, Stow, Mass., assignor to Ark-Les Switch Corporation, Watertown, Mass.**

**Filed Aug. 17, 1970, Ser. No. 64,373**
**Int. Cl. H01h** *9/26*
**U.S. Cl. 200—5 EB** **7 Claims**



A pushbutton actuated multiple slide switch adapted for use with push-in wire connectors, having a housing providing two series of discrete openings and containing a plurality of fixed and cooperating movable integral terminal elements adjacent the openings, each element comprising a retaining portion providing a resilient locking tongue and a cooperating contact portion opposed to the tongue for retaining a conductor wire inserted through the opening.

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**3,652,812**

## TAP CHANGER SWITCH WITH RADIAL PRESSURIZED MOVABLE CONTACT STRUCTURE

**Donald J. Ristuccia, Athens, Ga., assignor to Westinghouse Electric Company, Pittsburgh, Pa.**

**Filed Sept. 28, 1970, Ser. No. 75,916**
**Int. Cl. H01h** *19/56*
**U.S. Cl. 200—8 R** **10 Claims**

A tap changer switch for mounting within the casing of an electrical transformer, and operable from outside the casing. An insulating base member carries a plurality of stationary contacts, adapted for connection to the transformer winding, and a shaft member is disposed through an opening in the insulating base member such that it extends outwardly from both sides thereof. One outwardly extending portion of the shaft member carries a movable contact assembly which selectively shorts two adjacent stationary contacts, and the other outwardly extending portion of the shaft member is adapted to extend through the wall of the casing of the associated transformer, and it includes a handle for rotating the shaft and selecting the two stationary contacts to be shorted.

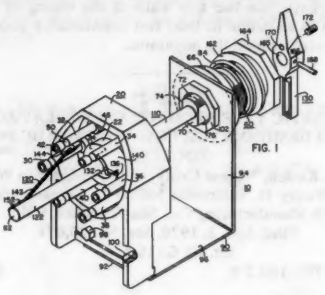

FIG. 1

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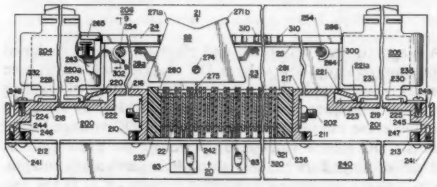
**3,652,813**

## CORDLESS ELECTRIC CROSS CONNECT PANEL WITH IMPROVED RECIPROCATING CONTACT ASSEMBLY

**Ariel R. Davis, 3476 Fleetwood Drive, Salt Lake City, Utah**

**Filed Jan. 13, 1971, Ser. No. 106,085**
**Int. Cl. H01h** *15/00*
**U.S. Cl. 200—16 D** **13 Claims**



A cross connect or patch panel has a bus bar supply section, a cross connect load section and a support frame for the supply and load sections. The thin bus bars of the supply section are spaced by insulating strips and thin separators between the strips and bars. The support frame has two supports extending longitudinally along opposite edges of said supply section. The load sections have individual modules with load rails fastened thereto. Circuit breakers are, respectively, attached to opposite ends of the modules and the supports. The supports also function as heat sinks. The load rails of the modules are respectively connected to the circuit breakers by flexible leads and may be flat or L or U shapes. The modules have notches corresponding to respective bus bars and the contact assemblies have indexing keys fitting in the slots so that the conductive blades of the contact assemblies are definitely fitted in the desired grooves.

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**3,652,814**

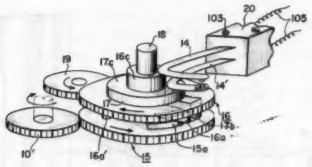
## RECIPROCATING AND ROTATABLE CAM ACTUATING MEANS FOR ELECTROMECHANICAL TIMERS

**Kozaburo Kanazawa; Eiji Kawakami, both of Tokorozawa, and Yasuo Kamiyama, Yokohama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan**

**Filed May 22, 1970, Ser. No. 39,751**
**Claims priority, application Japan, May 23, 1969, 44/40075**
**Int. Cl. H01h** *43/18*
**U.S. Cl. 200—33 B** **2 Claims**

In a timer switch for a timepiece the two spring biased contacts are maintained in spaced relation by means of two con-

centric rotatable cam members which normally bear against the flat upper surface of a timing plate having spaced-apart slots therein. Upon rotation of the cam means by the conventional time keeping gear train, the cam supporting the uppermost spring contact will drop into the spaced slots first allowing the upper spring contact to move into engagement with the lower spring contact to close the switch. Continued



movement of the time keeping gear train allows the second cam supporting the lower spring contact to drop into the slot means and allow the lower spring contact to separate from the upper spring contact. Continued rotation of the cams will lift both of the cams simultaneously out of the spaced slots to restore the spring contacts to their original position while maintaining them in spaced-apart relation.

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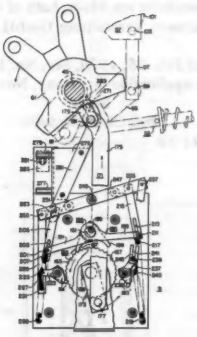
**3,652,815**

## CIRCUIT INTERRUPTER WITH MOTOR OPERATED SPRING CHARGING MEANS INCLUDING TWO RATCHETS AND TWO PAWLS

**Norman Davies, Trafford, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Jan. 14, 1971, Ser. No. 106,330**
**Int. Cl. H01h** *3/30, 3/34*
**U.S. Cl. 200—153 SC** **11 Claims**



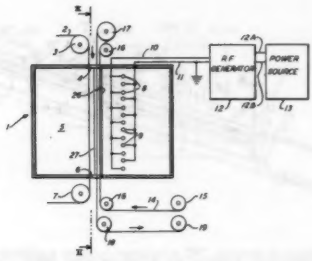
A motor operated circuit interrupter comprises an overcenter spring structure operable to a spring-charged closed position to prepare the circuit interrupter for a spring opening operation and to a spring-charged open position to prepare the circuit interrupter for a spring closing operation. Releasable latch means latches the overcenter spring structure in both of the spring charged positions. A motor operating mechanism comprises ratchet means operated by a motor and operable to operate the circuit interrupter to both of the spring-charged positions. The ratchet means comprises two ratchets and two pawls, one pawl and ratchet set engageable to charge the spring in one position, and the other pawl and ratchet set engageable to charge it in its other position.

**3,652,816**

## SELF CLEANING DIELECTRIC HEATER

**Mark Preston, New Ipswich, N.H., assignor to Litton Business Systems, Inc., New York, N.Y.**

**Filed Apr. 13, 1970, Ser. No. 27,615**
**Int. Cl. H05b** *5/00, 9/06*
**U.S. Cl. 219—10.61** **4 Claims**




High frequency heating apparatus including means for generating a high frequency electromagnetic field, means for exposing a material to be heated to said electromagnetic field, a barrier web or sheet between said electrode means and said material so as to collect matter expelled by the material as it is being heated, means for continuously moving the barrier so as to continuously remove the expelled matter from the apparatus, the barrier having a low dielectric loss factor so as to not consume field energy.

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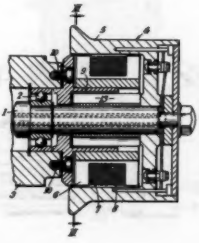
**3,652,817**

## ELECTRICALLY HEATED ROLLER ARRANGEMENTS

**Joseph France, Harwood, near Bolton, England, assignor to T.T.M. (Research) Limited, Oldham, Lancashire, England**

**Filed Dec. 14, 1970, Ser. No. 97,970**
**Claims priority, application Great Britain, Dec. 15, 1969, 61,021/69**
**Int. Cl. H05b** *5/00, 9/06*
**U.S. Cl. 219—10.61** **8 Claims**

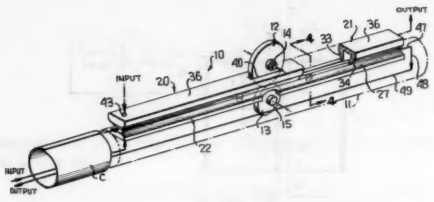


An electrically heated roller has an electric coil mounted in the core member of the assembly. The core has a plurality of slots extending inwardly from the periphery of the core member in a radial direction with respect to the coil, and parallel to the axis of the coil. The slots serve to reduce local eddy currents, and to provide air cooling passages.

## 3,652,818
## INERT ATMOSPHERE SEAM WELDER

Paul M Erlandson, Palos Park; Anton A. Aschberger, Oak Lawn; Donald J. Roth, Chicago Heights; John T. Cary, Markham, and George F. Bartimes, Chicago, all of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed July 31, 1970, Ser. No. 59,938
Int. Cl. B23k 9/16
U.S. Cl. 219—72 12 Claims

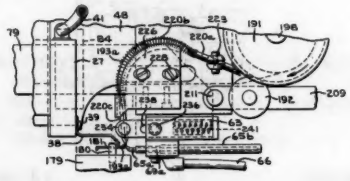



This disclosure relates to a resistance seam welder for welding lapped sheet material, particularly can bodies, and includes means for effecting inert gas flow between roller electrode surfaces and the interface of the lapped can body edge portions, the flow effecting means being in the form of a manifold into which is introduced inert gas while flexible sealing means are provided for sealingly contacting opposite surfaces of the can body edge portions. In one embodiment of the invention the manifold is formed of two hollow bodies having pairs of walls in sealing contact with at least one pair of the walls being flexible to permit the passage of the lapped edges therethrough as the can body blank is moved along an associated horn. In an alternative embodiment the walls are relatively rigid and each carries flexible seals to permit the passage of can body blanks therethrough. In a final embodiment, the manifold is defined by a plurality of radial ports formed in the roller electrodes with each electrode carrying a pair of annular seals for localizing the inert gas at the seam as it is being welded.

## 3,652,819
## SOLDERING APPARATUS WITH VARIABLE FEED

Archie F. Kerr, Noblesville, and Karl R. Lagler, Indianapolis, both of Ind., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Jan. 7, 1971, Ser. No. 104,671
Int. Cl. B23k 3/06
U.S. Cl. 219—85 15 Claims

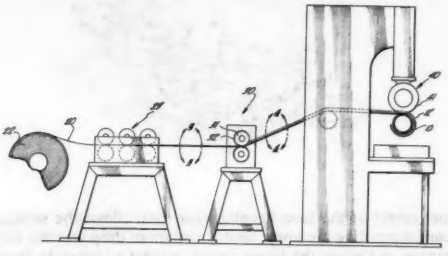


A soldering apparatus comprising automated mechanisms for positioning solder heating electrodes in contacting relationship with successively aligned areas of piece parts to be soldered, and a solder feed mechanism including a resilient, energy storing portion for advancing solder, in wire form, to the heated areas at a rate which may vary so as to continuously match the melt-off rate of the solder.

## 3,652,820
## METHOD OF MANUFACTURING A TWISTED SEGMENTED FINNED TUBE

Robert Carl Boose, Pryor, Okla., assignor to Escoa Fintube Corporation, Pryor, Okla.

Filed Jan. 26, 1970, Ser. No. 5,782
Int. Cl. B23k 9/02, 11/02, 11/04
U.S. Cl. 219—107 4 Claims

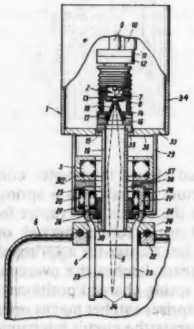


A method of manufacturing a twisted segmented finned tube is disclosed in which the method comprises the steps of feeding a continuous strip of flat coil stock from a roll onto a three-stage roll former which progressively bends the one edge of the flat stock to form an L-shaped strip having a major fin portion and a continuous base portion oriented perpendicular thereto. The L-shaped strip is then fed into an apparatus which simultaneously cuts and twists the major fin portion of the stock to form segmented twisted fins thereon. The stock is then helically wound onto a tube with the base portion being continuously welded thereto by a weld wheel.

## 3,652,821
## ELECTRON GUN FOR HEATING MATERIALS IN AN EVACUATED CONTAINER

Walter A. Dietrich, Hanau am Main, and Helmut G. M. V. Dellery, Grossauheim am Main, both of Germany, assignors to Leybold-Heraeus Verwaltung GmbH, Cologne-Bayental, Germany

Filed Feb. 25, 1970, Ser. No. 14,008
Claims priority, application Germany, Nov. 6, 1967, P 19 55 846.4
Int. Cl. B23k 9/00
U.S. Cl. 219—121 EB 2 Claims



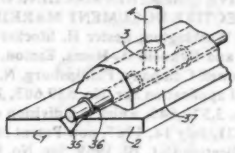
An electron gun for heating materials in vacuo, including an electron beam source, an electron lens, a deflector, yoke means connecting the deflector and winding means.

3,652,822

## ELECTRODE HOLDER FOR CONTINUOUS SUBMERGED SELF-ARC WELDING

Hajime Nakamura, Tokyo, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 18, 1970, Ser. No. 47,442
Claims priority, application Japan, June 24, 1969, 44/49805
Int. Cl. B23k 9/18
U.S. Cl. 219—130 4 Claims



A contact member holder for continuous submerged self-arc welding in which the contact member is movably mounted so as to press against a welding electrode when extended and to move away from the welding electrode when a trigger wire positioned forwardly of the electrode is burnt out by the welding heat.

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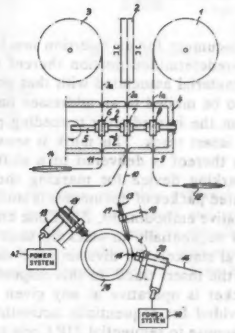
3,652,823

## INTERCHANGEABLE PLURAL ELECTRODE GUIDES FOR ELECTRIC ARC WELDING

Kurt Clemens, Dieringhausen, and Hans Klein, Bunghausen, both of Germany, assignors to L. & C. Steinmuller GmbH, Gummersbach Rhld, Germany

Filed Oct. 6, 1969, Ser. No. 864,032
Claims priority, application Germany, Oct. 29, 1968, P 18 05 737.9
Int. Cl. B23k 9/00
U.S. Cl. 219—130 8 Claims



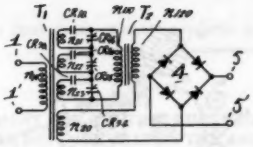
A device for the continuous mechanical welding of hollow bodies such as tubes includes a mounting means for one or more welding nozzles, and a plurality of welding wire feed nozzles which may be interchangeably engaged in the mounting means in a position such that they may feed the welding wire directly to the workpiece at a desired angular orientation. Each tubular feed nozzle is associated with a supply of welding wire from a reel supply and means are provided for feeding the welding wire to the associated nozzle. The wire feed nozzles can be used selectively as cold wire or as current nozzles depending on the welding method which is employed.

3,652,824

## DC ARC WELDER

Toshiyuki Okada, Osaka, Japan, assignor to The Osaka Transformer Co., Ltd., Osaka, Osaka-Prefecture, Japan

Filed Dec. 9, 1969, Ser. No. 883,447
Claims priority, application Japan, Dec. 13, 1968, 43/90932
Int. Cl. B23k 9/01
U.S. Cl. 219—131 WR 1 Claim



A DC welding system wherein DC power is applied to an electrode through a rectifier and the output of the rectifier is controlled by a transformer tap-changing system supplying power from a supply transformer through a second transformer in series with the rectifier. The tap changing system is controlled by selectively applying power to controlling relay coils through a diode matrix.

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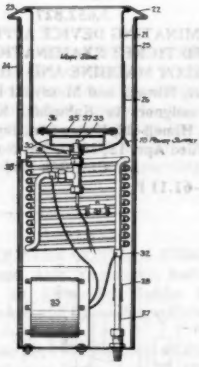
3,652,825

## LAMINAR GAS FLOW RINSING AND DRYING VESSEL

Howard M. Layton, Ossining, N.Y., assignor to Interlab Inc., Pleasantville, N.Y.

Original application Apr. 30, 1968, Ser. No. 725,408, now Patent No. 3,543,776, dated Dec. 1, 1970. Divided and this application May 22, 1970, Ser. No. 39,660
Int. Cl. F27d 7/02
U.S. Cl. 219—373 5 Claims

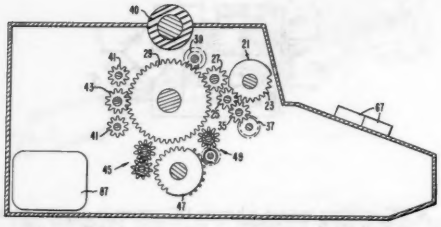


A process vessel for rinsing or drying small parts with an inert gas, the vessel being formed by an open tank having a work zone on which the parts are treated and a container therebelow covered by a porous membrane to serve as a flow impedance. The gas is fed into the container which acts as a pressure chamber, the gas passing through the impedance into the work zone to produce a laminar flow therein.

## 3,652,826
## BINARY ENTRY APPARATUS FOR A CALCULATING MACHINE

**Rene Chekroun, Montrouge, and Jean-Claude Ragot, Sevran, both of France, assignors to Burroughs Corporation, Detroit, Mich.**

**Filed Jan. 9, 1970, Ser. No. 1,627**
**Claims priority, application France, Dec. 19, 1969, 6917808**
**Int. Cl. G06c *9/00, 17/00***
**U.S. Cl. 235—61 PE** **29 Claims**

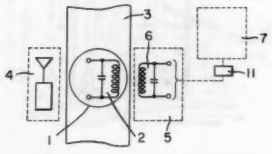


Decimal values are entered in a selector carriage of a calculating machine by means of a driving shaft, a plurality of friction clutches, and the controlled activation of a driven shaft and a gear wheel associated therewith. Control of the driven shaft and its associated gear wheel is provided by means of a plurality of slides responsive to key depression, four of said slides being separately activatable in the entry of decimal values 1, 2, 4 and 8 and activatable in selected combinations in the entry of values 3, 5, 7 and 9. A fifth slide provides for the controlled activation of a gear wheel associated with the driving shaft each time a key is depressed, to thereby effectuate a one unit translation of the selector carriage preparatory to the entry of the next lower order digit of the amount being entered.

## 3,652,827
## DISCRIMINATING DEVICE APPLICABLE FOR UNMANNED TICKET EXAMINATION, AUTOMATIC SLOT MACHINE AND THE LIKE

**Shigejiro Inoue, Himeji, and Masayuki Iguchi, Tatsuno, both of Japan, assignors to Kabushiki Kaisha Kokuei Kikgi Seisakusho, Himeji-shi, Hyogo-ken, Japan**

**Filed Apr. 15, 1970, Ser. No. 28,714**
**Int. Cl. G06k *7/01***
**U.S. Cl. 235—61.11 F** **3 Claims**

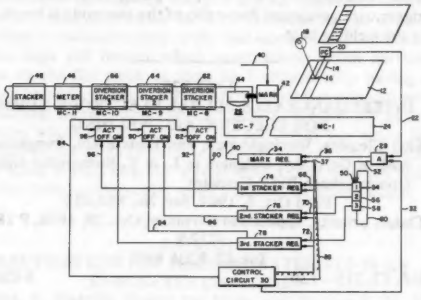


A discriminating and identifying device which is simple in its structure and permits no forgery in the cases when said devices are utilized for unmanned ticket examination apparatus, automatic slot machines and the like, said device comprising a member to be discriminated, an electric oscillating circuit provided in said member, a passage adapted to pass said member therethrough, and at least one detecting means which is provided in the vicinity of said passage and which cooperates with said oscillating circuit so as to produce an electric signal adapted to operate an assorting mechanism included in said apparatus or machine.

## 3,652,828
## SELECTIVE INSERTION MACHINE HAVING SELECTIVE DOCUMENT MARKING

**Eugene Sather, Washington; Lester H. Stocker, Phillipsburg, both of N.J., and Kenneth A. Hams, Easton, Pa., assignors to Bell and Howell Company, Phillipsburg, N.J.**

**Continuation of application Ser. No. 859,603, July 17, 1969, now Patent No. 3,570,840, which is a division of application Ser. No. 657,721, July 14, 1967, now Patent No. 3,484,100.**
**This application Oct. 20, 1969, Ser. No. 867,701**
**Int. Cl. G06k *7/10***
**U.S. Cl. 235—61.11 E** **13 Claims**




A control document for an insertion machine has a mark placed on a predetermined portion thereof to indicate that the insertion material associated with that particular control document is to be mailed to an addressee having a different ZIP Code from the immediately preceding packet of documents on the insert track. This mark is sensed and a signal representative thereof is delivered to a shift register which controls a marking device for marking the envelope into which the related packet of documents is stuffed.

In an alternative embodiment, ZIP Code change signals are also delivered sequentially to stacking shift registers which control integral stackers for diverting the various document packets from the insert track. In this respect, only one such diversion stacker is operative at any given time because a means is provided for sequentially activating the diversion stackers in response to sequential ZIP Code change signals.

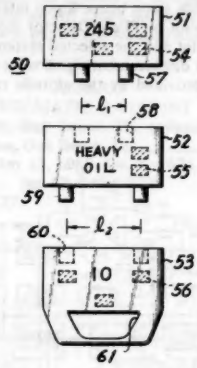
## 3,652,829
## DISCRIMINATION CARD FOR CARD READER

**Ken Hayakawa, Yokohama, and Mitsuaki Tamada, Sagamihara, both of Japan, assignors to Tokico Ltd., Kawasaki-Kanagawa-Ken, Japan**

**Filed July 2, 1970, Ser. No. 51,774**
**Claims priority, application Japan, July 3, 1969, 44/52942; Oct. 18, 1969, 44/99288**
**Int. Cl. G06k *19/04***
**U.S. Cl. 235—61.12 M** **5 Claims**

A discrimination card for card reader has plural and different information codes incorporated therein. The informa-

tion codes can be variably and desirably set up in one card. The discrimination card cooperates with a single card reader




which is capable of reading each information code and has a single card insertion slot.

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**3,652,830**

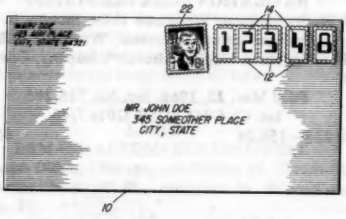
**MAGNETICALLY OR ELECTROSENSITIVE INKED NUMERALS IN PLACE OF STANDARD POSTAGE STAMPS**

**Henry F. Kessler, 1125 Sulphur Spring Road, Baltimore, Md.**

**Filed Sept. 17, 1969, Ser. No. 858,752**

**Int. Cl. G06k** *19/06*

**U.S. Cl. 235—61.12 N** **5 Claims**




Stamps with a machine readable numeral component of the zip code are provided. Purchased and used as postage, these stamps are applied to the mail in plurality for optimum machine sorting by the combinations thus made. The sender in this way provides for complete machine handling at the post office.

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**3,652,831**

**CALCULATING DEVICE FOR ESTIMATING TURBINE STEAM RATES**

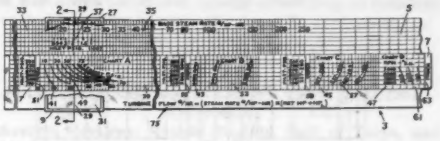
**David M. Lehmann, Narberth, Pa., assignor to Worthington Turbine International, Inc., Wellsville, N.Y.**

**Filed Jan. 8, 1971, Ser. No. 104,993**

**Int. Cl. G06g** *1/02*; **G06c** *3/00*

**U.S. Cl. 235—70 R** **5 Claims**

A slide rule-type calculating device for estimating steam consumption in single curtis stage steam turbines. The device includes a casing having a steam rate scale, a slide member movable endwise in the casing and carrying a series of graphical plots indicative of steam rate variation with respect to selected operating variables, and a hair-line slide. Appropriate displacement of the slide member and hair-line slide serves to effectively combine coordinate values on said



plots to yield a final steam estimate readable on the steam rate scale.

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**3,652,832**

**ARRANGEMENT FOR CONTROLLING PROCESSES WHICH ARE DEPENDENT UPON THE ANGULAR POSITION OF A ROTATING MEMBER**

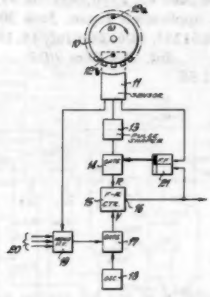
**Gunther Baumann, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany**

**Filed Feb. 26, 1970, Ser. No. 14,513**

**Claims priority, application Germany, Feb. 26, 1969, P 19 09 525.1**

**Int. Cl. G06m** *1/274, 3/14*

**U.S. Cl. 235—92 MP** **11 Claims**



In a motor vehicle a rotating disk has marking which are sensed, converted to pulses and applied to a counter which has been reset. The counter furnishes a control signal when the counted number of pulses is equal to the preset number. The counter is preset by applying pulses from an oscillator during the time a monostable multivibrator is in the unstable state. This depends upon at least one operating parameter of the motor vehicle.

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**3,652,833**

**SHEET COUNTER CONTROL CIRCUIT**

**Hideto Shigemori, and Akio Yamamoto, both of Tokyo-to, Japan, assignors to Kabushiki Kaisha Kokuei Kikai Seisakusho, Hyogo-ken and Glory Kogyo Kabushiki Kaisha, Tokyo-to, Japan**

**Filed June 23, 1970, Ser. No. 49,020**

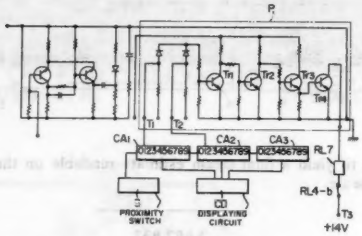
**Claims priority, application Japan, June 30, 1969, 44/51376**

**Int. Cl. G0bm** *9/00*

**U.S. Cl. 235—92 SB** **4 Claims**

A control circuit for sheet-counting apparatus of the type having a plurality counting heads using vacuum, comprising a plurality of digital counter circuits for supplying a lower or a higher voltage depending on whether the count of the digits included in each of the digital counter circuits does coincide or not with preset values, a comparator circuit receiving voltages from selected digital counter circuits and operating to give an output when any one of the input voltages is of a

higher level, a first relay energized when the sheets are counted, and a second relay operated through a contact of the first relay from the output of the comparator circuit,




whereby the second relay is energized only after the counting operation of the apparatus is completed and when the counted result does not coincide with the preset value.

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**3,652,834**

## SHEET COUNTER

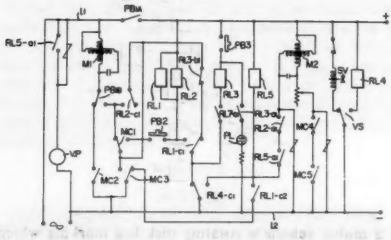
**Hideto Shigemori, and Akio Yamamoto, both of Tokyo-to, Japan, assignors to Kabushiki Kaisha Kokuei Kikai Seisankusho, Himeji-shi, Hyogo-ken and Glory Kogyo Kabushiki Kaisha, Tokyo-to, Japan**

**Filed June 23, 1970, Ser. No. 49,022**

**Claims priority, application Japan, June 30, 1969, 44/61241; 44/61242; 44/61243; 44/61244; July 18, 1969, 44/56913**

**Int. Cl. G06m 9/00**

**U.S. Cl. 235—92 SB** **5 Claims**




A sheet counter in which sheets such as bills are inserted in a openable holder, and wherein a counting operation is started by depressing a designated button, and upon completion of counting the number of sheets a comparison between a counter value on a counter display and a set pre-value is made, and depending upon the comparison, opening and closing operation of the holder are controlled, thereby to actuate the lamp display, whereafter the counter display is reset; and further the resetting circuit and the vacuum pump operating circuit for said sheet counter are described.

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**3,652,835**

## AIRCRAFT GLIDE SLOPE COUPLER SYSTEM

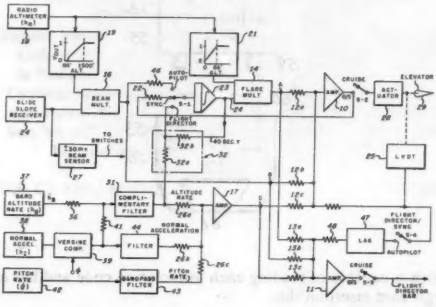
**Bernard T. Devlin, and William F. Poland, both of Phoenix, Ariz., assignors to Sperry Rand Corporation**

**Filed May 14, 1970, Ser. No. 37,073**

**Int. Cl. G06g 7/78; G01s 1/18**

**U.S. Cl. 235—150.22** **14 Claims**

A glide slope coupler adaptable to both Autopilot and Flight Director modes for guiding an aircraft to a landing along a radio defined glide slope beam. An integrator common to both modes effectively memorizes the aircraft descent rate and provides a signal representative thereof for summation with glide slope beam displacement and altitude rate signals in respective amplifiers coupled to drive the pitch actuators and Flight Director Indicator bar. A synchronizing mode is included for coupling the pitch actuator driver amplifier output to the integrator input to obtain a desired descent rate signal while flying in a cruise mode prior to intercepting the glide slope beam. Upon intercepting the beam either the Autopilot or Flight Director mode is activated as chosen by the pilot and the selected system then operates to reduce the beam displacement signal to zero with flight path damping being provided by the altitude rate signal. During the descent the beam displacement signal is modified as a function of altitude to compensate for the convergence of the glide slope beam. At a predetermined flare altitude the beam displacement signal is rendered ineffective and thereafter the integrator output signal is modified as a function of altitude to control the flare in accordance with the memorized value of the descent rate at the commencement of the flare maneuver.

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**3,652,836**

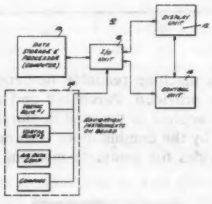
## NAVIGATION DIRECTOR SYSTEM

**Donald W. Richardson, Woodland Hills; Stanley N. Roscoe, Los Angeles, and Edward Streeter, Woodland Hills, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.**

**Filed Mar. 22, 1968, Ser. No. 715,205**

**Int. Cl. G06f 15/50; G01s 7/46**

**U.S. Cl. 235—150.26** **55 Claims**




A navigation system is disclosed in which a displayed map is continuously and accurately controlled during flight of an aircraft to display the true relation between the aircraft and the terrain over which it passes. The displayed map is automatically selected from a plurality of stored maps for display, in response to pilot-initiated signals. A cockpit control panel is provided with manually actuable controls for the selection of a start point and a destination which define a direct great circle route therebetween. A route segment indication is displayed of the selected direct route or at a manually-selected offset course. The indication is displayed at a distance from an aircraft symbol which corresponds to the flight path error. A vernier deviation indication is displayed to provide a mag-

nified presentation of the flight error. A series of indicators provides supplementary operating and status data to the pilot. The indicators include a Dead Reckoning indicator which indicates that the system is navigating in a dead reckoning mode, and an Off Chart indicator to indicate that the aircraft position is not on the selected navigation map.

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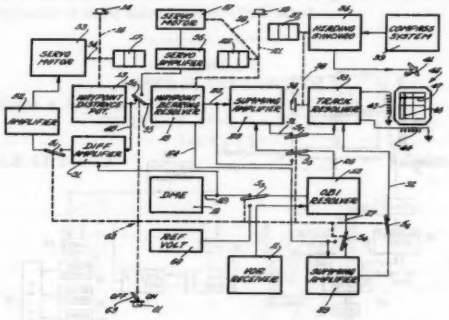
### 3,652,837
### AUTOMATIC WAYPOINT

**Earl Stuart Perkins, Oak Brook, Ill., assignor to Butler National Corporation, Oak Brook, Ill.**

**Filed May 13, 1969, Ser. No. 824,164**
**Int. Cl. G06g 7/78**
**U.S. Cl. 235—150.27** **14 Claims**




An area navigation system which allows a waypoint to be set at any time to determine its bearing and distance from TACAN or VORDME station. When the automatic waypoint circuitry is on the coordinates of the aircraft are indicated in the rho and theta indicators at all times. When the pilot desires to set in a waypoint he can turn off the automatic waypoint circuitry and the area navigation system will operate with the coordinates of the waypoint set in at the time of switching and the position of the aircraft will then be indicated relative to the waypoint at all times.

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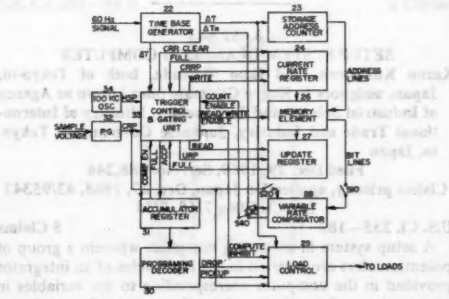
### 3,652,838
### DEMAND AUTOMATED COMPUTER

**Vearl Joseph Dillon, Chicago, and Walter M. Threewitt, Carpentersville, both of Ill., assignors to Edac Company, Chicago, Ill.**

**Filed Mar. 2, 1970, Ser. No. 15,348**
**Int. Cl. G06f 15/56**
**U.S. Cl. 235—151.31** **3 Claims**




A computer and controls system which monitors the application of power or other quantities subject to demand in which increased costs results due to periodic periods of high demand and controls loads on the system so that the cost is minimized while maintaining the desired service. This invention also allows continuous demand monitoring on industrial processes which are necessary for a specific application.

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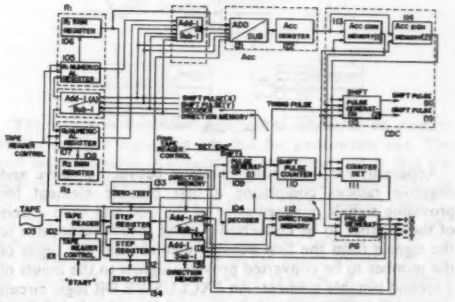
### 3,652,839
### PULSE ALLOTTING SYSTEM OF CURVE TRACING EQUIPMENT

**Takasumi Maekawa; Ryoichi Yoshida, both of Tokyo, and Minoru Nishihara, Yokohama, all of Japan, assignors to Toyo Denki Seizo Kabushiki Kaisha, Tokyo, Japan**

**Continuation-in-part of application Ser. No. 575,816, Aug. 29, 1966, now abandoned. This application Mar. 6, 1970, Ser. No. 17,277**
**Claims priority, application Japan, Sept. 7, 1965, 40/54428**
**Int. Cl. G06f 7/38, 15/46**
**U.S. Cl. 235—152** **24 Claims**



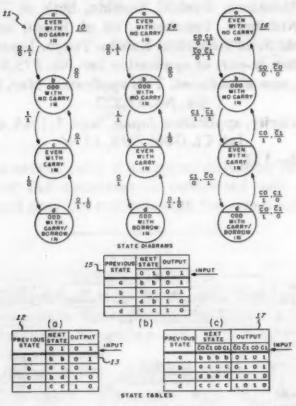

A pulse allotting system for use in a pulse allotter of a curve tracing equipment such as a numerical control system, wherein a curve is traced by allotting pulses having components corresponding to X and Y axes. The allotment is based on a series of judgements each of which selects a judging point having coordinates displaced by ($\Delta x/2, \Delta y/2$) from a point having coordinates $x$ and $y$ and where $\Delta x$ and $\Delta y$ are increments of $x$ and $y$, said point $x$ $y$ being either an initial starting point or a point by which the curve is traced and to judge whether said judging point is situated in a positive region or a negative region of the curve to be traced. The system comprises a means to effect allotment of a series of pulses each of which corresponds to the increment of $\Delta x$ and $\Delta y$ along a direction parallel to the X axis or to the Y axis based upon the judgement at said judging point according to whether the corresponding judging point is situated in a positive region or a negative region of the curve to be traced.

The system can afford further improvement in addition to the above mentioned initial judgement by selecting a second judging point in each of the judgements in accordance with the result of the initial judgement, in which said second judging point has co-ordinates displaced by either ($\Delta x, \Delta y/2$) or ($\Delta x/2, \Delta y$) according to the initial judgement from an initial starting point or from a point by which the curve is traced. The system includes means to effect allotment of a series of pulses each of which corresponds to an increment of $\Delta x$ or $\Delta y$ along the X axis or the Y axis or both X and Y axes based upon the above two judgements. According to the system a great improvement in tracing accuracy can be obtained while using a very simple construction.

## 3,652,840
## APPARATUS FOR CONVERTING NUMBERS BETWEEN POSITIVE AND NEGATIVE RADICES

**Walter C. Lanning, Plainview, N.Y., assignor to Sperry Rand Corporation**

**Filed June 23, 1970, Ser. No. 49,440**
**Int. Cl. G06f** *5/02*
**U.S. Cl. 235—155** **8 Claims**

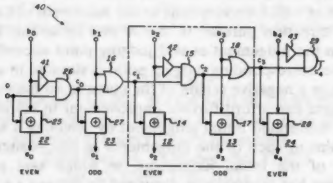



Apparatus for converting numbers between positive and negative radices comprising a first bistable element for providing signals representative of the odd and even orders of the number to be converted. Gating means responsive to the signals from the first bistable element and the digits of the number to be converted provides signals to the inputs of a second bistable element. An EXCLUSIVE OR logic circuit coupled to the output of the second bistable element and responsive to the digits of the number to be converted provides the converted digits of the number. Means are included to preset the first and second bistable elements to predetermined states, respectively, independently of the signs of the numbers to be converted.

## 3,652,841
## APPARATUS FOR CONVERTING NUMBERS BETWEEN POSITIVE AND NEGATIVE RADICES

**Walter C. Lanning, Plainview, N.Y., assignor to Sperry Rand Corporation**

**Filed June 23, 1970, Ser. No. 49,211**
**Int. Cl. H03k** *13/243*
**U.S. Cl. 235—155** **6 Claims**

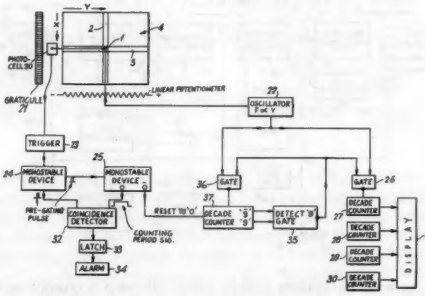



Apparatus for converting numbers between positive and negative radices comprising a plurality of EXCLUSIVE OR logic circuits responsive to the digits of the numbers to be converted, respectively. A plurality of AND logic gates responsive to the digits of the even orders of the numbers, respectively, and a plurality of OR logic gates responsive to the digits of the odd orders of the numbers, respectively, are included. Each AND gate and each EXCLUSIVE OR circuit associated with a particular even order is responsive to the output of the OR gate associated with the odd order preceding the particular even order. Each OR gate and each EXCLUSIVE OR circuit associated with a particular odd order is responsive to the output of the AND gate associated with the even order preceding the particular odd order.

## 3,652,842
## AREA MEASUREMENT

**John Ernest Lewin, 30 Lyndhurst Ave., Mill Hill, London, N.W. 7, England**

**Filed Feb. 5, 1970, Ser. No. 8,805**
**Int. Cl. G06g** *7/18*
**U.S. Cl. 235—183** **5 Claims**




Apparatus for measuring an unknown area within a predetermined area, comprising: a pointer movable over the predetermined area by an operator to track the boundary of the unknown area; first and second means movable with the pointer to define co-ordinates for the pointer position within the predetermined area, the first such means generating first electrical signals at regularly spaced intervals along one co-ordinate axis to represent a graticule, and the second such means generating second electrical signals proportional to the spacing of the pointer position along the other co-ordinate axis from a reference position; means for interrogating the second signals in response to each of the first signals as the unknown area boundary is tracked; and means for summing the interrogated second signals to indicate the unknown area.

## 3,652,843
## SETUP SYSTEM IN ANALOG COMPUTER

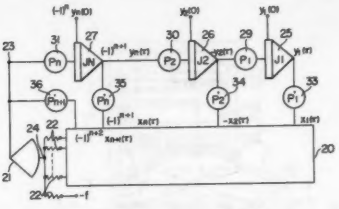
**Kazuo Kurokawa, and Ikuo Matsuda, both of Tokyo-to, Japan, assignors to Kogyo Gijutsuin (also known as Agency of Industrial Science and Techonology, Ministry of International Trade and Industry, Japanese Government, Tokyo-to, Japan**

**Filed Dec. 29, 1969, Ser. No. 888,246**
**Claims priority, application Japan, Dec. 27, 1968, 43/95342**
**Int. Cl. G06g** *7/18, 7/36*
**U.S. Cl. 235—183** **5 Claims**

A setup system in an analog computer wherein a group of potentiometers are inserted in the input sides of an integrator provided in the computer corresponding to the variables in an equation to be solved, and another group of potentiometers are inserted in the output sides of the integrators so that the factors for the time and amplitude employed for the variables can be controlled separately and in a unitary manner.

In another aspect of the invention, a dummy variable is in-

troduced by an additional provision of an integrator, whereby the solution of an equation having a coefficient which tends



to be infinitive at a time instant within a range for which the equation is to be solved is much facilitated.

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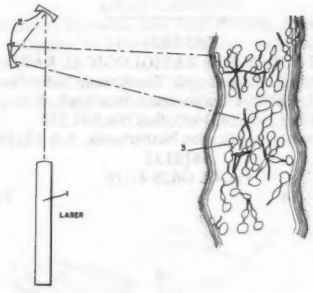
**3,652,844**
**LASER PLANT CONTROL**
**Ralph A. Scott, Jr., 2819 Elsmine St., Fairfax, Va.**
**Filed Feb. 9, 1970, Ser. No. 9,779**
**Int. Cl. F21**
**U.S. Cl. 240—1** **9 Claims**




A method and apparatus for destroying weeds and other obnoxious plants by the selective application of laser energy. The apparatus includes a pulsed laser and a system for dispersing the laser beam to provide adequate coverage of the target area.

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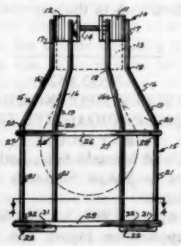
**3,652,845**
**LAMP GUARD**
**Frank W. Thomas, 100 Dairy Road, Parkton, Md.**
**Filed June 17, 1970, Ser. No. 47,052**
**Int. Cl. F21v** *15/00*
**U.S. Cl. 240—54 R** **2 Claims**



A lamp guard having a clamping band for securing the same to a lamp socket, a plurality of substantially U-shaped wire members having the free ends of the legs thereof integrally secured to the clamping band and extending to one side of the clamping band and adapted to enclose and protect a lamp; and a pair of rings, one integrally joined to the legs of the wire members at an intermediate point thereon and the second integrally joined to the bight portions of the U-shaped members.

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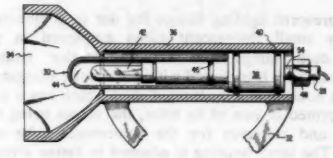
**3,652,846**
**UNDERWATER HAND LIGHT**
**Walter A. Starck, II, P. O. Box 592, Big Pine Key, Fla.**
**Original application Mar. 14, 1968, Ser. No. 713,114, now Patent No. 3,500,037. Divided and this application Jan. 12, 1970, Ser. No. 7,433**
**Int. Cl. F21l** *11/00*
**U.S. Cl. 240—10.63** **1 Claim**



The invention described hereinafter relates to an electric hand-type light especially adapted for underwater use. The new lamp is unique in several respects, especially in that the light source is adapted to be slidably positioned relative to its co-operating reflector; and, it is also easily slidably removable from its reflector association for independent use. A special light source is employed which also forms a part of the invention. The light source is of the quartz-iodide type and by reason of particular mounting features, it is rendered especially adapted for underwater use, particularly as regards its light-giving life.

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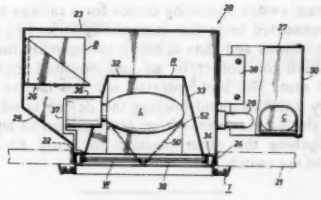
**3,652,847**
**RECESSED CEILING LIGHT FIXTURE**
**Ralph M. McFarlin, Pasadena, Tex., assignor to Esquire, Inc., New York, N.Y.**
**Filed Apr. 8, 1970, Ser. No. 26,705**
**Int. Cl. F21s** *1/00;* **F21v** *17/00;* **F21s** *3/00*
**U.S. Cl. 240—78 HA** **17 Claims**



A light fixture having a housing which fits closely within the lower end of a recess in a ceiling, and a reflector which has a frame about its open lower end for fitting closely within the lower end of the recess. The frame is releasably attached to the housing when so fitted to permit it to be moved through the lower end thereof, whereby access may be had to the interior of the housing above the reflector from beneath the ceiling.

3,652,848

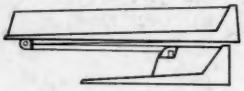
## FLUORESCENT LIGHTING FIXTURES

Jack V. Miller, and Ronald W. Froelich, both of c/o Mentos Corp., 401 Agostine Road, San Gabriel, Calif.

Continuation-in-part of application Ser. No. 620,806, Mar. 6, 1967, now abandoned. This application Aug. 21, 1968, Ser. No. 777,209

Int. Cl. F21s 1/12

U.S. Cl. 240—81 C 2 Claims



A fluorescent lighting fixture for use in conjunction with relatively small fluorescent tubes employed in portable lamps, desk lamps and vehicle interior lamps. The fluorescent tube is mounted within a simple, elongated housing. The housing is a multisided shell which has a trough or recess formed in one of its sides, the recess being both the support and reflector for the fluorescent tube mounted therein. The lamp housing is adapted to fasten directly to a wall or ceiling in one embodiment, and is adapted to being supported by a cantelevered arm and base for desk or table use in another embodiment.

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3,652,849

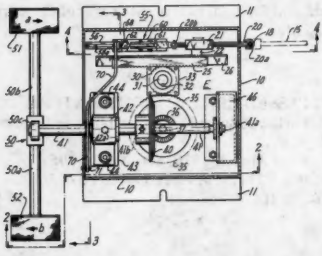
## FOOT OPERATED TRACK SWITCH

Raymond J. Kleppick, 2035 Osgood St., Pittsburgh, Pa.

Filed Mar. 13, 1970, Ser. No. 19,298

Int. Cl. B61l 5/02

U.S. Cl. 246—393 14 Claims



A manual switch operating device for a railway track has a switch-connected lever that is normally locked in either one of two positions and that is easily and quickly moved from one position to another by an end-mounted foot-pressure-operated arm. The foot-operated arm has means for simultaneously unlocking and holding the device in an unlocked position during movement from one position to another and upon reaching the other position to cause an automatic locking of the switch.

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3,652,850

## MEASUREMENT OF OPTICAL DENSITY

Ronald Briggs, Stevenage, England, assignor to National Research Development Corporation, London, England

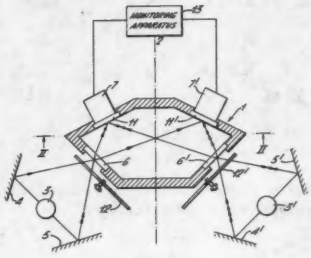
Filed Mar. 6, 1970, Ser. No. 17,223

Claims priority, application Great Britain, May 22, 1969, 26,287/69

Int. Cl. G01n 21/26

U.S. Cl. 250—43.5 R 21 Claims

Method and apparatus for determining the optical density for radiation within a predetermined range of wavelengths in which a first signal is produced related to the attenuation of radiation over a known path length in the fluid, a second signal is produced related to the attenuation of the radiation over the same path length by solid matter suspended in the fluid and the second signal is utilized to correct the first signal for the presence of the suspended solid matter in the fluid.



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3,652,851

## PATIENT'S COUCH FOR RADIOLOGICAL RADIATION

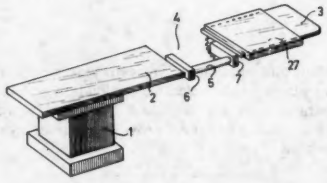
Willem Zaalberg, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 14, 1969, Ser. No. 841,236

Claims priority, application Netherlands, July 18, 1968, 6810132

Int. Cl. G03b 41/16

U.S. Cl. 250—54 7 Claims



A table for supporting a patient during radiological treatment, the table having first and second surfaces longitudinally spaced apart defining between them a transverse gap, and a beam connecting and supporting the second surface with the first surface, the beam being movable between different transverse positions in the gap area to provide unimpeded radiation.

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3,652,852

## METHOD OF SUPERIMPOSING THE RADIATION EMISSION FROM A RADIOACTIVE TRACER ON AN X-RAY IMAGE

Tatsuo Miyazawa, and Masashi Sato, both of Yokohama-shi, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Apr. 2, 1969, Ser. No. 812,688

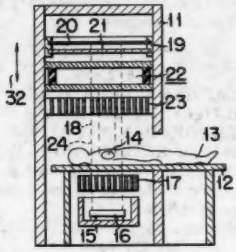
Claims priority, application Japan, Apr. 5, 1968, 43/22138; 43/22141

Int. Cl. G03b 41/16

U.S. Cl. 250—65 R 2 Claims

A system for taking a radiograph of a foreground subject in which a radioactive material is distributed on a film by an X-ray radiographic apparatus having a spark chamber. The

radiograph consists of an X-ray transmission image of said subject and a discharge image indicating the distribution of




said radioactive material. Said both images have the same scale and are superposed on each other.

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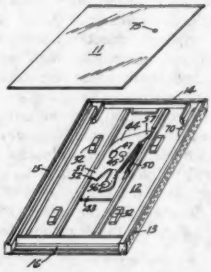
**3,652,853**

## X-RAY CASSETTE

**Mario Williner, Ferrania, and Enzo Breschi, Savona, both of Italy, assignors to Minnesota Mining and Manufacturing Company**

**Filed Mar. 26, 1970, Ser. No. 22,764**
**Claims priority, application Italy, Mar. 29, 1969, 36086 A/69**
**Int. Cl. G03b *41/16***
**U.S. Cl. 250—66** **9 Claims**



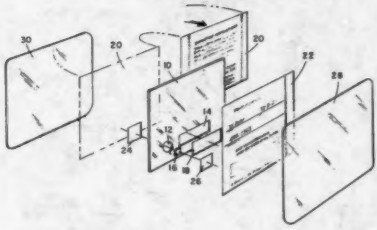
An X-ray cassette which is loaded with film and unloaded automatically by cassette-handling apparatus. The cassette comprises an exterior case having an opening to receive actuating means from the casette-handling apparatus, film-carrying panels within the exterior case adapted to hold film while it is radiographically exposed, and control means operatively connected to the film-carrying panels and adapted to be engaged by the actuating means from the casette-handling apparatus. The control means applies the movement of the actuating means to the film-carrying panels to move the panels between film-exposure and film-load-unload positions. In one embodiment the actuating means is a pin that undergoes forward and return movements and the control means includes a slide member and a control lever pivotably mounted on the slide member, both the slide member and the control lever being apertured to receive the actuating pin. During film-exposure, a portion of the control lever engages a lock member within the cassette to lock the slide member, control lever and film-carrying panels in their film-exposure positions.

**3,652,854**

## CARD-FORMAT PERSONNEL DOSIMETER

**Robert V. Wheeler, Lemont, Ill., assignor to Technical Operations, Incorporated, Burlington, Mass.**

**Filed Dec. 9, 1970, Ser. No. 96,664**
**Int. Cl. G01t *1/11***
**U.S. Cl. 250—71 R** **10 Claims**



A dosimeter in the form of a laminate card is depicted. More specifically, a dosimeter card is shown which comprises a stiff but flexible backing plate having apertures for holding one or more materials sensitive to high energy radiation. Adhesive-backed stickers carrying identification and/or instructional information are adhered back-to-back on the plate, securing the radiation sensitive materials in their respective apertures. The plate and stickers are encapsulated between heat-bonded polyester and Mylar sheets.

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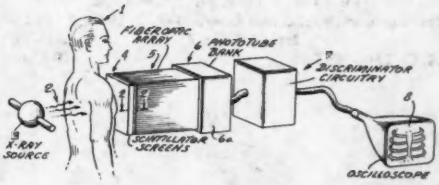
**3,652,855**

## RADIATION IMAGE AMPLIFIER AND DISPLAY COMPRISING A FIBER OPTIC MATRIX FOR DETECTING AND CODING THE RADIATION IMAGE PATTERN

**John Armin McIntyre, 2316 Beistol St., Bryan, Tex., and Dwight Proffer Saylor, 1220 Westover St., College Station, Tex.**

**Filed May 26, 1969, Ser. No. 827,759**
**Int. Cl. G01t *1/20*; G02b *5/14***
**U.S. Cl. 250—71.5 S** **14 Claims**



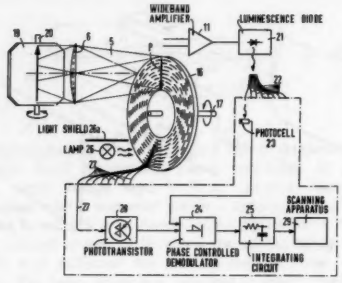

A radiation image amplifier is disclosed comprising a fiber optic matrix for detecting and coding the radiation image pattern and photosensitive amplifying means for converting the coded image into electrical signals which are amplified and then utilized by decoding to produce an enlarged and intensified image display. The fiber matrix is coded in such manner as to minimize the size of the photosensitive amplifying means.

3,652,856

## APPARATUS AND METHOD FOR IMAGE CONVERSION OF INFRARED RADIATION

Bernt Paul, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 18, 1970, Ser. No. 20,697
Claims priority, application Germany, Mar. 25, 1969, P 19 15 048.2
Int. Cl. G01j 1/02
U.S. Cl. 250—83.3 HP 59 Claims



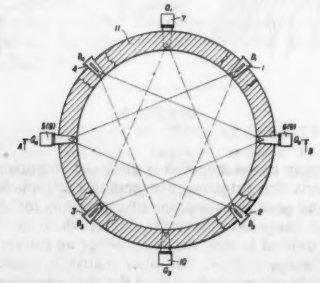

A radiation detector produces a control signal in accordance with radiation impinging thereon. An optically effective modulator comprising a chopper directs radiation from a specimen section to the surface of the radiation detector in a manner whereby the surface is marked with various image points in a predetermined geometrical arrangement at various carrier frequencies. The radiation detector produces a signal which is the sum of all the image intensity pulses impressed upon the various carrier frequencies. A separator coupled to the radiation detector separates the image point pulses in accordance with their carrier frequencies. Storers coupled to the separator individually store the separated image point pulses. A scanner coupled to the storers scans the stored image point pulses in accordance with the sequence of the marked image point in order to provide a suitable control signal.

3,652,857

## ARRANGEMENT FOR DETERMINING THE AVERAGE HEIGHT AND THE THREE-DIMENSIONAL PROFILE OF NONWOVEN SURFACES

Erich Frevert, Vienna, Austria, assignor to Osterreichische Studiengesellschaft fur Atomenergie Ges. m.b.H., Vienna, Austria

Filed Feb. 3, 1969, Ser. No. 804,732
Claims priority, application Austria, Feb. 2, 1968, A 1041/68
Int. Cl. G01n 23/10
U.S. Cl. 250—43.5 FL 10 Claims



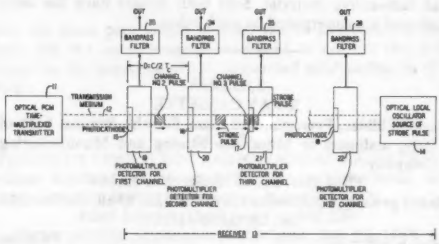
An arrangement for checking the depth of the charge and for determining the profile of the surface comprises radiation sources and radiation detectors in different planes. he sources are arranged above the uppermost plane of the detectors and the sources of different planes are displaced with respect to each other. Source and detectors are placed at the corners of an octagon. The chronological control is effected by a comparison arrangement compensating the decay of the activity of the radiation sources.

3,652,858

## OPTICAL HETERODYNE TIME-DIVISION DEMULTIPLEXER EMPLOYING STROBED ASSIGNMENT OF CHANNELS AMONG A TANDEM SEQUENCE OF HETERODYNING ELEMENTS

Tracy Stewart Kinsel, Bridgewater Township, Somerset County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 25, 1970, Ser. No. 75,543
Int. Cl. H04b 9/00
U.S. Cl. 250—199 5 Claims




There is disclosed a receiver for a time-division-multiplex optical PCM communication system in which demultiplexing is achieved without power-division losses by directing the received pulse trains recurring at a multiple of the channel bit rate and the local oscillator or strobe pulses at the channel bit rate in opposite directions and sequences through aligned heterodyning elements, such as semitransparent photocathodes of photomultiplier detectors for the individual channels. The received pulses and local oscillator pulses have differing optical frequencies; and the coincidences of these pulses are sensed at the channel detectors to separate the channels. Illustratively, the coincidences at the photomultipliers are sensed by electrical filters having a passband including an upper cutoff frequency lower than the channel bit rate and means for disabling the output of the filter in time for reception of a signal in the next time slot for that channel.

3,652,859

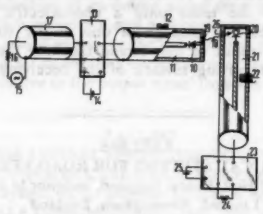
## AMPLIFIER DEVICE USING EMISSION AND PHOTO DIODES

Hans-Norbert Toussaint, Munich, Germany, assignor to Siemens & Halske Aktiengesellschaft, Berlin and Munich, Germany

Continuation of application Ser. No. 355,121, Mar. 26, 1964, now abandoned. This application Aug. 26, 1968, Ser. No. 778,355
Claims priority, application Germany, Apr. 1, 1963, S 84504; Dec. 20, 1963, S 88823; S 88824
Int. Cl. H01j 15/00
U.S. Cl. 250—211 J 1 Claim

An electro-optical amplifier for oscillations, particularly in the range of very short electromagnetic waves comprising an amplifier input circuit including at least one emission diode, a direct current source connected to the emission diode for biasing the emission diode in a flow direction, the emission diode being operative to transform the electrical signal oscillation into an optical signal, at least one photodiode optically connected with the emission diode, an output amplifier circuit operatively connected with the photo diode, the photodiode being operative to transform the received optical signal into electrical oscillation signals, and the amplified

signals appearing at the output of the amplifier output circuit. The emission diode of the photodiode is arranged in



sections of coaxial conductors which are closed at the end and which have windows disposed adjacent to the diodes to allow light to be transmitted between the two diodes.

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**3,652,860**

**RADIATION SENSITIVE ANALYTICAL CENTRIFUGE**

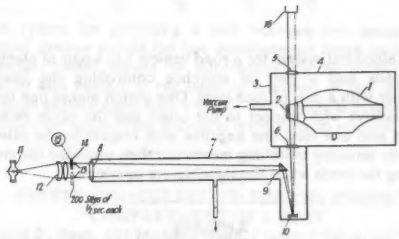
**Peter Martin Brabazon Walker, Lasswade, Scotland, assignor to MSE Holdings Limited, Sussex, England**

**Filed June 29, 1970, Ser. No. 50,426**

**Claims priority, application Great Britain, June 27, 1969, 32741/69**

**Int. Cl. G01n *21/26***

**U.S. Cl. 250—218** **11 Claims**



An analytical centrifuge comprises a cell scanning system having a radiation input arrangement having a slit defining a beam of radiation of elongate section directed at a cell so that the length direction of the section is at right angles to the rotor radius, there being means for displacing the beam stepwise for radiating successive radially displaced zones of the cell.

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**3,652,861**

**APPARATUS FOR DETECTING THE HARDNESS LEVEL OF WATER**

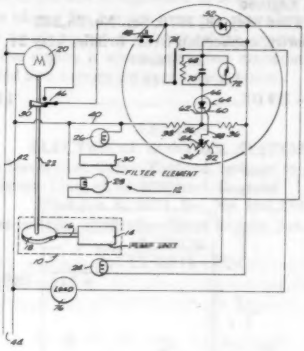
**Richard K. Engholdt, Wauwatosa, Wis., assignor to Erie Manufacturing Company, Milwaukee, Wis.**

**Filed Apr. 1, 1969, Ser. No. 812,086**

**Int. Cl. G01n *21/26***

**U.S. Cl. 250—218** **5 Claims**

A control including a sampling means for periodically extracting a sample of water from a water system and a detection means for determining the hardness level of the sample. The sample is mixed with a reagent adapted to cause the sample to change color at a predetermined hardness level. The color of the sample is compared with that of a filter element by means of a pair of photoconductive cells connected in series in one leg of a bridge circuit. A difference in color between the sample and filter element indicating a hardness level above a give level will cause the bridge circuit to become unbalanced. A silicon controlled rectifier is connected across the bridge and will fire when the bridge becomes unbalanced causing a relay to be energized and thus




provide power to initiate the regeneration cycle of a water softener apparatus.

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**3,652,862**

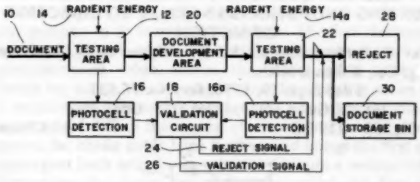
**METHOD AND APPARATUS FOR DOCUMENT VALIDATION**

**Jack E. Bayha, 11753 Sperry Road, Chesterland, Ohio**

**Filed Feb. 4, 1970, Ser. No. 8,476**

**Int. Cl. G01n *21/30***

**U.S. Cl. 250—219 DR** **9 Claims**



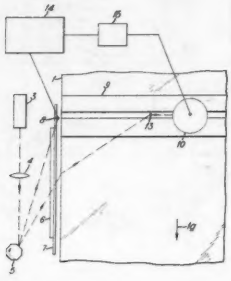

The invention provides a unique method and apparatus to validate documents. Particularly, the method comprises forming a developable area on the surface of a paper document, scanning the surface before development, causing development, and then scanning the same surface after development so that a before and after scanning must meet predetermined signal acceptance criteria to provide a validation. The development is achieved by some external force or media acting on the document, with the document responding to such force or media to change its physical characteristics. The apparatus to achieve this sequence of method steps consists of appropriate testing areas incorporating radiant energy sources and appropriately responsive photocells, or other detectors, plus the development area and a validation circuit, all operating in cooperation to measure the surface appearance or characteristics before and after development of one or more portions of the document. Development normally is contemplated to be by heat, pressure, moisture, fumes, electric current, or the like.

3,652,863

## DETECTION OF FAULTS IN TRANSPARENT MATERIAL USING LASERS

Philip Hedley Gaskell, Preston, and Derek Lowe, Rainford, both of England, assignors to Pilkington Brothers Limited, Liverpool, England

Filed May 18, 1970, Ser. No. 38,242
Claims priority, application Great Britain, May 21, 1969, 25,996/69
Int. Cl. G01n 21/32
U.S. Cl. 250—219 DF 11 Claims



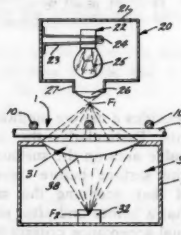
Apparatus for inspecting transparent sheet material for internal defects comprises a laser, a scanning device for scanning the laser beam across the sheet, and a light detector for detecting light scattered by internal defects. Analysing apparatus is used to analyze signals from the scattered light and thereby identify the nature of the defects. A reference light detector is positioned adjacent the edge of the sheet so that the time interval between detection of the beam by the reference detector and the detection of a defect gives a measure of the position of the defect.

3,652,864

## MEASURING LENGTH OF WIRE FABRIC BY COUNTING ONLY STRANDS NORMAL TO DIRECTION OF MOTION

Gustav B. Person, Allegan, Mich., assignor to W. E. Dunn Mfg. Co., Holland, Mich.

Filed Sept. 29, 1970, Ser. No. 76,521
Int. Cl. G01n 21/30; G06f 7/38; G06g 7/00
U.S. Cl. 250—219 LG 11 Claims



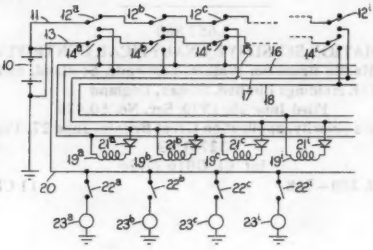
Parallel wire strands of wire fabric having a first set of parallel strands perpendicular to a second set of parallel strands are counted as the fabric is moved through a beam of light. The beam is expanded by a projection lense such that its projection area on the wire fabric includes a dimension parallel to the strands being counted which is greater than the thickness of those wire strands perpendicular to the strands being counted such that only a portion of the beam can be blocked by such a strand. On the opposite side of the fabric, the light is received by a refocusing lense having an elongated receiving surface, oriented parallel to the strands being counted and having a width less than or equal to the thickness of one of the strands being counted. That portion of the light which is received at said receiving surface is refocused by the lense onto a photoelectric cell which thereby detects the passage of one of the strands to be counted as a result of that strand blocking the passage of light to the receiving surface of the receiving lense as it passes.

3,652,865

## ELECTRICAL SYSTEMS FOR ROAD VEHICLES

William David Holt, Coine, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Apr. 21, 1970, Ser. No. 30,562
Claims priority, application Great Britain, July 28, 1969, 37,708/69
Int. Cl. H02g 3/00
U.S. Cl. 307—10 R 2 Claims



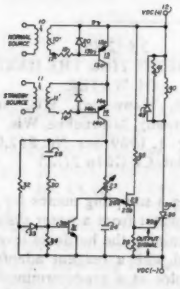
An electrical system for a road vehicle has a pair of electrical loads and a pair of switches controlling the loads, together with a pair of feed lines. One switch makes one feed line positive with respect to the other and the other switch makes said one feed line negative with respect to the other. Polarity sensitive switching means are then provided for controlling the loads when the switches are operated.

3,652,866

## IN-PHASE MONITOR FOR DETERMINING IN-PHASE CONDITION OF TWO SEPARATE ALTERNATING CURRENT SOURCES

William A. Moakler, Basking Ridge, and Ralph H. Ringstad, Whippany, both of N.J., assignors to Automatic Switch Company

Filed Sept. 14, 1970, Ser. No. 71,694
Int. Cl. H02j 3/00
U.S. Cl. 307—80 10 Claims



An in-phase monitor including two switch means, e.g., transistors, each connected to a different AC source. One transistor conducts during alternate half cycles of its respective power source, and the other transistor conducts only when the first transistor is conducting and when the voltages

of the power sources are of the same sign. When both transistors conduct, a capacitor is charged, and if the charge becomes high enough a third transistor becomes conductive causing production of an output signal from the monitor. A transfer switch includes a coil and contacts for alternatively connecting a load to one or the other of the power sources, and a circuit for controlling energization of the coil includes a relay responsive to the output signal from the monitor.

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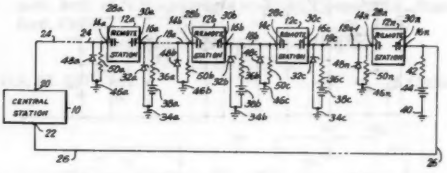
**3,652,867**

## DEVICE FOR CONNECTING A SUBSTITUTE CURRENT PATH IN CASE OF LINE BREAK

**Leon Zinn, Syosset, N.Y., assignor to Milton Bocin, Teaneck, N.J. and AFA Protective Systems, Inc., New York, N.Y.**

**Filed May 28, 1970, Ser. No. 41,433**
**Int. Cl. H02j 3/00; G08b 25/00**
**U.S. Cl. 307—86** **11 Claims**




A system for providing a path between two series-connected devices should the line therebetween break including a bypass switch means for interconnecting the output of a first of said devices to the input of a second of said devices through ground upon such a break. The system is particularly adapted for application to central station alarm systems.

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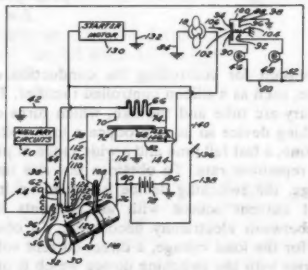
**3,652,868**

## SAFETY EXHAUST SYSTEM FOR THE ENGINE COMPARTMENT OF A BOAT

**Harold P. Hunt, 432 Madison Road, County Club Acres RR1, Delray Beach, Fla.**

**Filed Feb. 4, 1970, Ser. No. 8,587**
**Int. Cl. H01h 35/00**
**U.S. Cl. 307—116** **13 Claims**




Two basic embodiments of the safety exhaust system are provided. In one embodiment, switch means are provided in the fuel inlet to the gas tank of the engine. These switch means are actuated by removal of the gas cap to start a blower fan motor in the engine compartment to exhaust any fumes which collect therein during a fueling operation. The blower fan is deenergized upon replacement of the gas cap. In the other embodiment, the blower fan is energized by the ignition switch in one position to exhaust any fumes from the engine compartment before the engine is started. Means are provided to prevent energization of the engine starter motor until the blower fan has run for a preselected time interval to thereby assure proper ventilation of the engine compartment before the engine is started. The two embodiments may be integrated into a single safety exhaust system.

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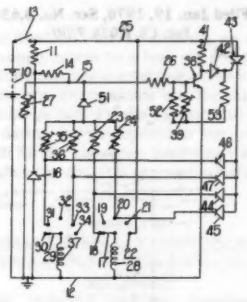
**3,652,869**

## ELECTRICAL CONTROL SYSTEMS

**William David Holt, Colne, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England**

**Filed Jan. 6, 1971, Ser. No. 104,234**
**Claims priority, application Great Britain, Jan. 17, 1970, 2,369/70**
**Int. Cl. H01h 47/26**
**U.S. Cl. 307—117** **1 Claim**



An electrical control system, particularly for a choke cable on a vehicle, includes a pair of electromagnets, each of which when energized moves the choke cable back from its operative position to its inoperative position. The first electromagnet is energized when the engine temperature rises to a predetermined value, moves the choke cable back, and brings the second electromagnet into the circuit in series with a resistor which determines when the second electromagnet is energized. When the second electromagnet is energized, it moves the choke cable back further, and brings the first electromagnet back into the circuit in series with a resistor which determines the engine temperature at which the first electromagnet is energized again. This sequence continues until the choke cable returns to its rest position. Other parameters can be controlled in a similar way.

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**3,652,870**

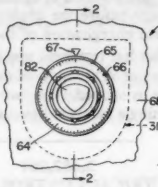
## TIMER CONSTRUCTION MEANS AND SYSTEM UTILIZING THE SAME OR THE LIKE

**Emil Niemand, Waterbury, Conn., assignor to Robertshaw Controls Company, Richmond, Va.**

**Filed June 17, 1970, Ser. No. 47,011**
**Int. Cl. H01h 7/16**
**U.S. Cl. 307—133** **32 Claims**

A timer construction having a frame means carrying a timer motor. A time selector is carried by the frame means for selecting a desired time period that the timer motor is to operate. An actuator is operatively associated with the timer motor to initiate the operation thereof after a desired time period has been selected by the time selector. The time selector is adapted to selectively increase or decrease the selected time period during the operation of the timer motor as long as the new selected time period is not less than the initial

lapse of time of the initial time period at the time the new time selection is made by the time selector. The actuator can




comprise a push button means which indicates the amount of time lapsing during the operation of the timer.

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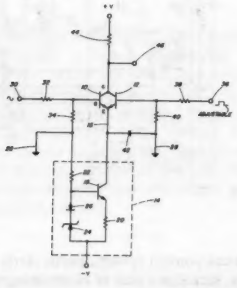
**3,652,871**

**EXPONENTIAL ATTENUATOR-AMPLIFIER CIRCUIT**

**Arthur D. Delagrange, Sykesville, Md., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed Jan. 19, 1970, Ser. No. 3,656**
**Int. Cl. H03k** *7/00*
**U.S. Cl. 307—230** **3 Claims**



An exponential attenuator-amplifier circuit having a pair of transistors coupled back-to-back in a modified common emitter configuration as its principal active components. This arrangement utilizes the logarithmic current-voltage characteristic of the base-emitter diode of one of the transistors so that it operates as a logarithmic voltage amplifier, while a DC voltage applied to the other transistor sets the voltage bias level and controls the voltage gain of the pair. A current source is included in the emitter circuit of the transistor pair to render circuit current independent of bias voltage changes.

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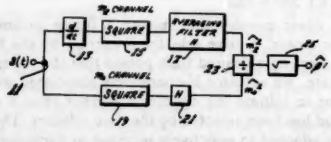
**3,652,872**

**VIDEO BANDWIDTH ANALYZER**

**Kenneth H. Miller, Reston, Va., assignor to The United States of America as represented by the Secretary of the Air Force**

**Filed Apr. 2, 1970, Ser. No. 25,061**
**Int. Cl. H03k** *5/20*
**U.S. Cl. 307—233** **1 Claim**




Bandwidth measurement using direct time domain measurement of second moment bandwidth signals is achieved by feeding the unknown signal into parallel channels and then dividing one channel by the other and taking the square root thereof. The first channel has a differentiating circuit followed by a squaring circuit and then an averaging filter while the second channel has a squaring circuit followed by an averaging filter.

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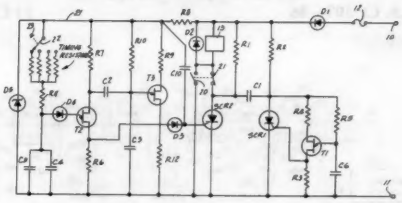
**3,652,873**

**DIRECT CURRENT TIMER**

**Robert D. Roberts, Streetsboro, Ohio, assignor to Houdaille Industries, Inc., Buffalo, N.Y.**

**Filed July 1, 1970, Ser. No. 51,567**
**Int. Cl. H03k** *17/28, 17/30, 17/72*
**U.S. Cl. 307—252 M** **2 Claims**



An automatic timing circuit for controlling a pump solenoid valve or other device which may be adjusted over a wide range of cycles per hour and which may be manually energized if desired.

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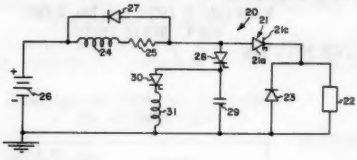
**3,652,874**

**CIRCUIT FOR CONTROLLING THE CONDUCTION OF A SWITCHING DEVICE**

**Donald F. Partridge, 1036 Harlan Drive, San Jose, Calif.**

**Filed July 30, 1970, Ser. No. 59,521**
**Int. Cl. H03k** *17/04, 17/72*
**U.S. Cl. 307—252 M** **23 Claims**



A circuit for controlling the conduction of a switching device, such as a silicon controlled rectifier, Thyratron tube, mercury-arc tube and the like, which turns on and off the switching device so as to produce a load voltage with a fast rise time, a fast fall time and a wide range of pulse widths at a high repetition rate. To obtain a fast rise time of the load voltage, the switching device is turned on in series with a direct current source with all elements interconnecting therebetween electrically decoupled. To obtain a fast fall time for the load voltage, a direct current voltage is applied in series with the switching device which is of a polarity opposite from the polarity of the direct current source used to furnish power to the load. This reverse voltage is of an appropriate magnitude and time duration for turning off the switching device, and in addition thereto, electrically decouples the load from any direct current source at the same time as the switching device is reversed biased.

Toward this end, a reactive element is disposed in series with the direct current source and the switching device. It

has been found that energy is stored in the reactive element during the turning off or the commutation period of the switching device. Such stored or trapped energy in the reactive element inhibits the succeeding application of the appropriate magnitude and time duration of reverse voltage to the switching device for turning off the switching device. Consequently, such stored trapped energy is a detriment to commutating the switching device in succeeding commutation intervals. Thus, one embodiment of the present invention is to dissipate the trapped energy stored in the reactive element before the next commutation period. Another embodiment of the present invention is to inhibit the accumulation of trapped energy in the reactive element. Both embodiments have a small commutation interval, and are therefore capable of high switching rates.

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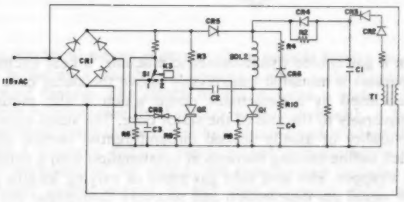
### 3,652,875
### CONTROL CIRCUIT FOR DRIVING STAPLING MECHANISM

**William P. Kukucka, Henrietta, and James E. Summers, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Sept. 9, 1970, Ser. No. 70,832**
**Int. Cl. H03k** *17/00*
**U.S. Cl. 307—252 M** **5 Claims**



A control circuit for driving a staple forming and punch apparatus incorporating an inductance coil, a first circuit coupled to the inductance coil including an SCR device and a second circuit including a second SCR device and DIAC device. A control energizes the DIAC device to fire at predetermined intervals so that said second SCR device may be turned on and the first SCR device turned off.

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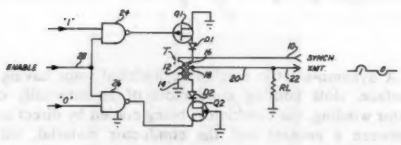
### 3,652,876
### DATA TRANSMISSION SYSTEM, UTILIZING AC LINE FREQUENCY AS CLOCK

**Elliot Baum, Dix Hills, and Harry R. Loewengart, New York, both of N.Y., assignors to Quasar Microsystems, Inc., Brentwood, N.Y.**

**Filed Apr. 30, 1970, Ser. No. 33,294**
**Int. Cl. H03k** *1/12, 17/60*
**U.S. Cl. 307—262** **10 Claims**



A data transmission system is described in which bipolar data signals are derived from an AC signal. The system comprises a transformer having a primary winding receiving the AC signal and a secondary winding. The ends of the secondary winding are respectively connected to switch means the control terminals of which receive data signals. The bipolar signal derived at the center tap of the secondary winding reflects the data signal inputs to the switch means.

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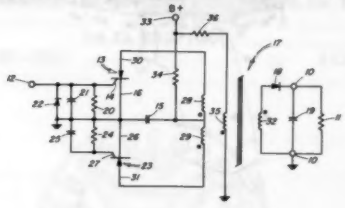
### 3,652,877
### RADIATION COMPENSATION CIRCUIT

**Richard A. Smith, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Navy**

**Filed May 14, 1969, Ser. No. 824,634**
**Int. Cl. H03k** *3/31, 3/37*
**U.S. Cl. 307—308** **1 Claim**



A radiation hardened circuit utilizing an energy storage capacitor to supply power to a load via a magnetic coupler. Triggered unidirectionally conductive active circuit elements connected between the capacitor and the magnetic coupler provide a discharge path for the capacitor to transfer power to the load during normal operation but provide another discharge path for the capacitor, inhibiting transfer of power to the load, when the circuit is exposed to radiation.

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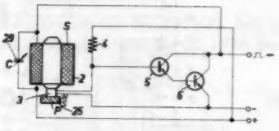
### 3,652,878
### ELECTROMAGNETICALLY CONTROLLED RELAY APPARATUS HAVING NO MECHANICAL CONTACT MEMBERS

**Karl Schmidt, Achern, Germany, assignor to GEHAP Gesellschaft fuer Handel und Patentverwertung mbH & Co.**

**Filed Mar. 11, 1969, Ser. No. 806,240**
**Claims priority, application Germany, Mar. 18, 1968, P 15 62 171.3**
**Int. Cl. G05d** *1/00*
**U.S. Cl. 307—309** **6 Claims**



A contactless relay with an electromagnetic control circuit and with either one or several electronic switching circuits, comprising within the range of the magnetic field of at least one relay coil of the electromagnetic control circuit a relay mechanism without any mechanical contact elements which is controllable by means of the magnetic field and in operative engagement with at least one controllable semiconductor system.

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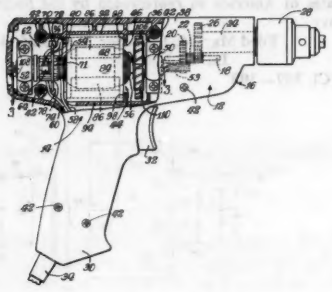
### 3,652,879
### ELECTRIC POWER TOOL

**Larry E. Plunkett, Montgomery, and Spencer C. Rees, Aurora, both of Ill., assignors to Thor Power Tool Company, Aurora, Ill.**

**Filed July 22, 1970, Ser. No. 57,176**
**Int. Cl. H02k** *7/14*
**U.S. Cl. 310—50** **8 Claims**

An electric power tool having a housing, a fan and a motor including brushes, a commutator, an armature, and a stator. The brushes are mounted on a brush board which fits closely

adjacent the commutator. The stator comprises a shell and circumferentially spaced permanent magnet segments secured to the shell, air passages being formed by the spaces between the segments. Openings are provided in the housing



to permit air to be drawn in by the fan, the air being channeled by the housing and the brush board over the commutator and through the passages in the stator, thus effectively cooling the commutator and the armature of the motor.

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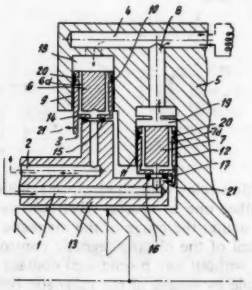
**3,652,880**

**ARRANGEMENT FOR SUPPLYING ROTOR OF AN ELECTRICAL MACHINE WITH A LIQUID COOLANT**

**Mihailo Starcevic, Ennetbaden, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland**

**Filed Nov. 30, 1970, Ser. No. 93,708**
**Claims priority, application Switzerland, Dec. 4, 1969, 18062/69**
**Int. Cl. H02k** *9/00*
**U.S. Cl. 310—54** **10 Claims**



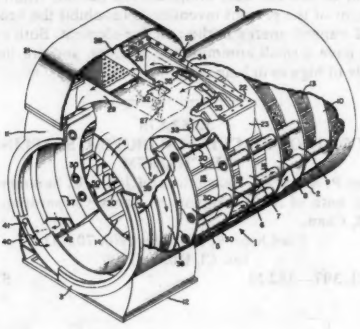
An arrangement for circulating a liquid coolant through a tubular conductor structure on the rotor of an electrical machine includes a stationary feed part provided with feed and discharge channels leading to feed and discharge rings through which the liquid coolant is fed to and discharged from liquid guide channels at one end of the rotor which are connected to the tubular conductor structure. The liquid coolant enters the discharge ring from the rotor at a point on the rotor which is farther outside — as seen radially — than the point at which the coolant enters the feed ring to flow into the rotor.

**3,652,881**

**GENERATOR VENTILATION DOME AND COOLER CASING CONSTRUCTION**

**Donald R. Albright, Scotia; James B. Archibald, Schenectady, and Sterling C. Barton, Scotia, all of N.Y., assignors to General Electric Company**

**Filed Oct. 15, 1970, Ser. No. 81,036**
**Int. Cl. H02k** *9/08*
**U.S. Cl. 310—57** **2 Claims**



In a gas cooled dynamoelectric machine, a heat exchange apparatus is mounted transversely above the stator core and is enclosed by a detachable dome which is also mounted transversely to the axis of the stator core. The stator core has a plurality of axially spaced circumferential section plates which define cooling sections in combination with a cylindrical wrapper. Hot and cold gas pipes of varying lengths provide equal gas distribution and recovery throughout the stator core while recirculation and cooling is accomplished through dome first and second annular chambers communicating with said pipes through holes in the wrapper plate.

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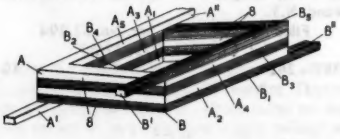
**3,652,882**

**DYNAMO-ELECTRIC MACHINE ROTORS HAVING INTERNALLY COOLED ROTOR WINDINGS**

**Joseph Merelle Elliott, Newcastle-upon-Tyne, England, assignor to Reyrolle Parsons Limited, Hebburn Co., Durham, England**

**Filed Aug. 25, 1970, Ser. No. 66,697**
**Int. Cl. H02k** *3/22*
**U.S. Cl. 310—61** **5 Claims**



A dynamo-electric machine cylindrical rotor having in its surface, slots housing conductors of an internally cooled rotor winding, the conductors being cooled by direct contact between a coolant and the conductor material, with the winding having its conductors formed in coils with successive turns of each coil occupying the same pair of slots symmetrically disposed, one on each side of a pole face of the rotor, successive coils occupying successive pairs of slots on respective sides of the pole face, each coil being formed of at least two coil portions, each coil portion comprising helical turns which are so arranged and interleaved with one another that, for at least some of the turns of a coil portion, the coil side in

one slot is displaced in a radial direction by at least one conductor thickness from the coil side in the other slot.

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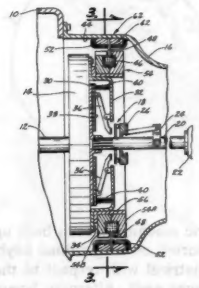
**3,652,883**

## VEHICLE POWER GENERATOR

William H. Cone, 733 Russell Road, Waterloo, Iowa

Filed Sept. 18, 1970, Ser. No. 73,496
Int. Cl. H02k 7/02
U.S. Cl. 310—74 4 Claims



An electrical power generator for a vehicle having an engine including a clutch bell housing having a clutch means mounted therein. The clutch means includes a plate cover secured to the engine flywheel for rotation therewith. A field means is mounted in the clutch bell housing and is adapted to create a magnetic field. A stator means is mounted on the inner periphery of the clutch bell housing and includes an electrical output means in the said magnetic field and adapted to be connected to an electrical load. A rotor means is secured to the plate cover for rotation therewith within said clutch bell housing. The rotor means is provided with a plurality of spaced apart teeth on the periphery thereof whereby the rotation of the rotor means by the plate cover will cause the teeth to vary the permeance of the magnetic field to induce an alternating electromotive force in the output means.

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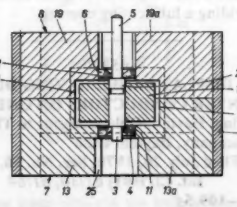
**3,652,884**

## ELECTRIC MOTOR FOR WATCHES

Georges C. Vuffray, La Chaux-de-Fonds, Switzerland, assignor to Girard-Perregaux S.A., La Chaux-de-Fonds, Canton of Neuchatel, Switzerland

Filed Oct. 12, 1970, Ser. No. 79,753
Claims priority, application Switzerland, Oct. 13, 1969, 15381/69; Apr. 10, 1970, 5353/70
Int. Cl. H02k 21/12
U.S. Cl. 310—156 14 Claims



The present invention concerns an electric motor for watches, composed of a rotor with permanent magnetization, a stator winding without core and with even spirals which presents a symmetrical plane parallel to the spirals and containing the axle of the rotor, a winding support made of nonmagnetic material and an annular yoke made of a ferromagnetic material with high permeability and low remanence surrounding the support.

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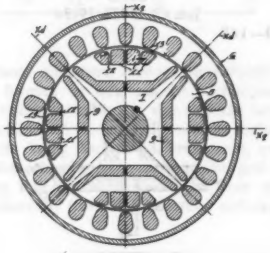
**3,652,885**

## SYNCHRONOUS RELUCTANCE MOTOR

Vernon B. Honsinger, Cincinnati, Ohio, assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Continuation of application Ser. No. 825,790, May 19, 1969, now abandoned. This application Sept. 16, 1970, Ser. No. 72,892
Int. Cl. H02k 19/00
U.S. Cl. 310—163 5 Claims



A synchronous reluctance motor having a rotor with a plurality of circumferentially spaced quadrature axis slots near the surface of the rotor and across the quadrature axes. The bridges across the outer end of the quadrature axis slots and the teeth between adjacent quadrature axis slots define a flux path that is so proportioned to cause saturation thereof at the motor pullout torque condition whereas they are unsaturated at the motor no-load condition.

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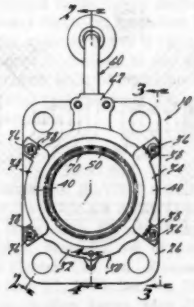
**3,652,886**

## SELF-ALIGNING SENSOR

Hugh E. Riordan, Wyckoff, and Malcolm D. Jones, Belleville, both of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Continuation of application Ser. No. 741,687, July 1, 1968, now abandoned. This application May 1, 1970, Ser. No. 31,853
Int. Cl. H02k 17/42
U.S. Cl. 310—168 15 Claims



An electrical rotational speed sensor constructed to provide an electrical signal indicative of the rotational speed between a pair of members one of which is supported for

rotation relative to the other and having a rotor connected to the rotatable member and a stator connected to the other stationary member and having a mounting structure for the rotor and stator whereby one of the rotor and stator can move radially in response to radial movement of the other of the rotor and stator as a result of relative movement between the two members.

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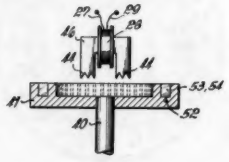
**3,652,887**

**PULSE GENERATOR**

**Bernd Taubitz, Pforzheim, and Karl Bachle, Schwieberdingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

**Filed Oct. 7, 1970, Ser. No. 78,675**
**Claims priority, application Germany, Oct. 8, 1969, P 19 50 647.9**
**Int. Cl. H02k** *19/24*
**U.S. Cl. 310—168** **9 Claims**




A magnetizable U-shaped core is surrounded by an energized winding so that stray flux is produced at the core ends. A rotary wheel has a circular recess in the region of the core ends in which alternate magnetizable and non-magnetizable parts are fixedly secured so that during rotation of the wheel, the flux passed alternately by said magnetizable and non-magnetizable parts is varied so that pulses are generated in the winding.

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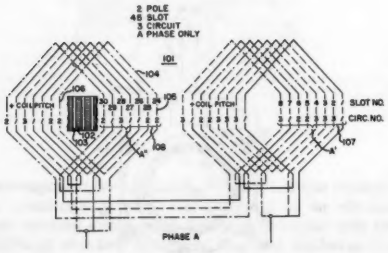
**3,652,888**

**TWO POLE, 45 SLOT, THREE CIRCUIT DYNAMOELECTRIC MACHINE WINDING PATTERN**

**Dean B. Harrington, Ballston Lake, N.Y., assignor to General Electric Company**

**Filed Mar. 18, 1971, Ser. No. 125,479**
**Int. Cl. H02k** *3/00*
**U.S. Cl. 310—198** **3 Claims**



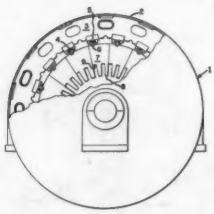

Winding patterns for two pole, three phase, dynamoelectric machines having 45 slots and three parallel connected circuits per phase, and arranged to reduce voltage and phase unbalance between circuits.

**3,652,889**

**LAMINATED DYNAMOELECTRIC MACHINE CORE AND METHOD OF STACKING**

**Paul Reece, Scotia, and Peter H. Graham, Schenectady, both of N.Y., assignors to General Electric Company**

**Filed Jan. 18, 1971, Ser. No. 107,342**
**Int. Cl. H02k** *1/12*
**U.S. Cl. 310—259** **3 Claims**



A dynamoelectric machine core is built up of laminations or punchings supported on longitudinal keybars, the laminations being asymmetrical with respect to the tooth and slot portions on the inner ends. Alternate layers of laminations are reversed and arranged so that the possibility of overheating due to induced voltage between keybars is minimized.

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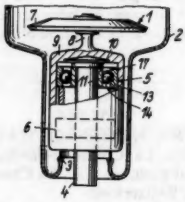
**3,652,890**

**X-RAY TUBE WITH ROTARY ANODES**

**Gunther Appelt, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany**

**Filed Feb. 16, 1970, Ser. No. 11,439**
**Claims priority, application Germany, Mar. 28, 1969, P 19 15 958.1**
**Int. Cl. H01j** *35/10*
**U.S. Cl. 313—60** **8 Claims**




X-ray tube with rotary anodes wherein the axis of the anode runs in ball bearings the casings of which consist of metal sheets joined by straps, is particularly characterized in that one sheet of casing has molded straps and consists of a hardenable material while the other sheet consists of a material providing a lubricating coating.

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**3,652,891**

**PLASMA DISPLAY PANEL HAVING DISPLAY AND COUNTER CONDUCTORS ON ONE PLATE**

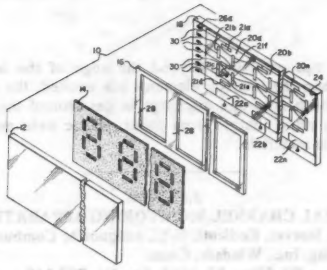
**John L. Janning, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio**

**Filed July 20, 1970, Ser. No. 56,396**
**Int. Cl. H01j** *61/30, 61/64*
**U.S. Cl. 313—109.5** **4 Claims**

A plasma display panel of the gas discharge type comprising a plurality of discrete electrically excitable gas-containing cells. Associated with each cell is a conductor array comprising a plurality of segments and a corresponding common conductor all positioned on the same surface. A transparent

dielectric film is deposited over each segment conductor array and each corresponding common conductor, so that all the conductors are capacitively coupled, but physically isolated from the excitable gas.

A particular character is displayed on the plasma display device by alternately energizing a selected one of the segment conductors comprising the segment conductor array and the corresponding common conductor. The excitable gas immediately adjacent the energized segment conductors and the corresponding common conductor is ionized, with a resulting illumination which is visible to the human eye. The



resulting illumination is confined to the area circumscribed by the energized segment conductors and the corresponding common conductor. In order to conceal the illumination generated by the common conductor, a mask is provided which contains a plurality of openings generally conforming in shape to the segmented conductor array and so positioned that the openings are aligned with a corresponding segment conductor. The illumination provided by the occurrence of the ionization is sufficient for the visual display of numeric, symbolic, and alphabetic information. The plasma display panel is hermetically sealed in order to prevent the escape of any of the excitable gas into the atmosphere.

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**3,652,892**

## ILLUMINATING LAMP HAVING CONCAVE SEGMENTS ON EXTERIOR BULB SURFACE

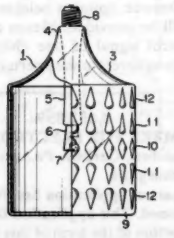
**Naoyoshi Nameda, and Tetsuhiro Kano, both of Yokohama-shi, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan**

**Filed Nov. 3, 1969, Ser. No. 873,517**

**Claims priority, application Japan, Nov. 4, 1968, 43/80252; Nov. 11, 1968, 43/97517**

**Int. Cl. H01j *5/16*; H01k *1/30***

**U.S. Cl. 313—116** **6 Claims**



An illuminating lamp wherein the bulb is fabricated into a complicated form characterized by a large number of surface irregularities so as to disperse light from a luminous source without losing its original brilliance and afford comfortable ornamental illumination by projecting light over a broad area from the various convex and concave segments of the bulb surface utilizing the primary refraction caused by the lenticular and prismatic action of said segments.

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**3,652,893**

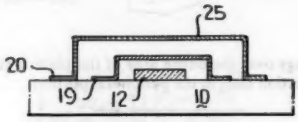
## VACUUM TUBE HAVING ALL ELEMENTS SECURED TO A COMMON SUBSTRATE

**Hyman Hurvitz, 1220 East West Highway, Silver Spring, Md.**

**Filed Nov. 20, 1970, Ser. No. 91,309**

**Int. Cl. H01j *1/88, 19/48, 19/08***

**U.S. Cl. 313—268** **5 Claims**



A non-coplanar miniature vacuum tube triode, having its elements all formed by photo-resist techniques, and all secured to a common substrate, the cathode being formed directly in contact with the substrate over its surface, and the grid and anode being formed as crossovers, one for the cathode and the other for both cathode and grid, in parallel planes, leaving free space between each pair of the electrodes, and inherently providing intertube isolation and high gain per tube.

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**3,652,894**

## INDIRECTLY HEATED HOT-CATHODES WITH PINK RUBY INSULATOR

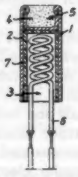
**Walter Held, Gunzburg, Germany, assignor to Licentia Patent-Verwaltungs G.m.b.H., Frankfurt, Germany**

**Filed June 30, 1970, Ser. No. 51,298**

**Claims priority, application Germany, July 1, 1969, P 19 33 309.6**

**Int. Cl. H01j *1/24, 19/18***

**U.S. Cl. 313—340** **3 Claims**



An indirectly heated hot-cathode has a metallic cathode sleeve having inner walls defining a cavity. An electric heating element is arranged in the cavity defined by the cathode sleeve. The necessary electrical insulation between the heating element and the cathode sleeve is maintained by an insulating member shaped to conform to and arranged to at least partially cover the inner walls of the cathode sleeve, and constructed of a material selected from the group consisting of ruby, quartz and sapphire.

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**3,652,895**

## SHADOW-MASK HAVING GRADUATED RECTANGULAR APERTURES

**Asahide Tsuneta, Kawasaki; Hiroshi Tanaka, Fukaya, and Yoshifumi Kiriake, Morioka, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan**

**Filed May 21, 1970, Ser. No. 39,382**

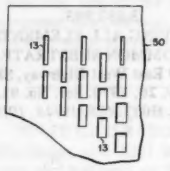
**Claims priority, application Japan, May 23, 1969, 44/47136; Sept. 2, 1969, 44/83080**

**Int. Cl. H01j *29/06, 31/20***

**U.S. Cl. 313—85 S** **6 Claims**

A shadow-mask for color television cathode-ray tubes, which has rectangular electron-beam-passing openings gradu-

ated in size and pitch from the center to the peripheral portion of the mask plate so that the ratio of the area occupied



by the openings over the entire area of the plate is greater in the central portion than in the peripheral portion.

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**3,652,896**

**CATHODE-RAY TUBE**

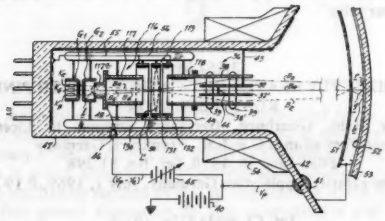
**Senri Miyaoka, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Aug. 26, 1969, Ser. No. 853,169**

**Claims priority, application Japan, Dec. 19, 1968, 43/93590**

**Int. Cl. H01j** *29/56*

**U.S. Cl. 315—31 TV** **7 Claims**



In a cathode ray tube, for example, a color picture tube in which a plurality of electron beams are made to converge or cross each other substantially at the optical center of an electrostatic focusing lens by which the beams are focused on the electron-receiving screen of the tube; the focusing lens includes first and second axially spaced, annular electrodes extending around the tube axis and being at the same potential, and a third annular electrode assembly extending between the first and second electrodes and which includes an axial array of at least three annular electrode portions, the electrode portions at the ends of the axial array being at a different potential than the first and second electrodes to establish the focusing electric field and at least one of the electrode portions intermediate the end portions being at a potential that deviates from the potential of the end electrode portions in a direction toward the potential of the first and second electrodes to modify the electric field so that its equivalent optical lens has relatively flatter surfaces for further reducing aberrations of the beam or beams focused thereby.

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**3,652,897**

**LAMINATED STATIC CHARGE SUPPRESSOR AND METHOD OF MAKING SAME**

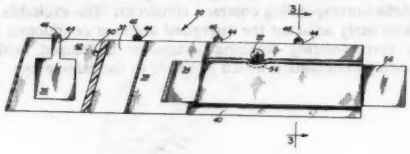
**Michael F. Iosue, Danielson, and Robert E. Sanders, Saybrook, both of Conn., assignors to Rogers Corporation, Rogers, Conn.**

**Filed Sept. 9, 1970, Ser. No. 70,781**

**Int. Cl. H01t** *19/04*; **H05f** *3/00*

**U.S. Cl. 317—2 F** **10 Claims**

A laminated static charge suppressing bus which is composed of a strip of insulating material to which a conducting strip and a plurality of ionizing elements are mounted. The conducting strip is mounted on one side of the insulating strip and the plurality of ionizing elements are mounted serially along the other side of the insulating strip directly opposite the conducting strip. The ionizing elements are capacitively coupled to the conducting strip and contain pointed



emitting tips extending beyond the edge of the insulating strip. When the ionizing elements are excited, the emitting tips establish a corona discharge in gas around the tips for removing static charges from paper, plastic webs and sheet-like textile materials.

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**3,652,898**

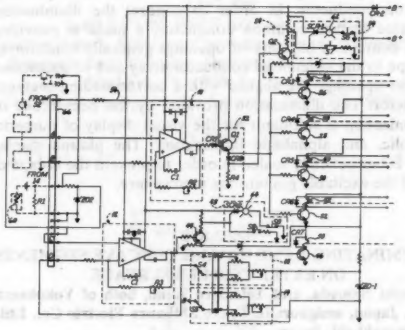
**DUAL CHANNEL MONITORING APPARATUS**

**Linda A. Steeves, Endicott, N.Y., assignor to Combustion Engineering, Inc., Windsor, Conn.**

**Filed Dec. 27, 1968, Ser. No. 787,318**

**Int. Cl. H02h** *3/28*

**U.S. Cl. 317—27** **9 Claims**



A two channel bistable trip circuit, each channel including a variable reference voltage source and voltage comparator circuit. An input signal commensurate with a variable being monitored is delivered to the comparator in each channel and, when the variable reaches preselected levels commensurate with the reference voltages selected for each channel, control signals will be provided. Means are also provided for isolating the control signal of one channel from apparatus normally responsive thereto under certain conditions.

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**3,652,899**

**SUPPORT MEMBER FOR ELECTRONIC PACKAGING**

**Homer Ernst Henschen, Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

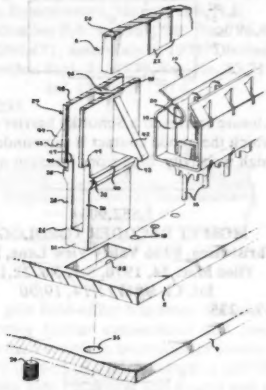
**Continuation-in-part of application Ser. No. 771,541, Oct. 29, 1968, now abandoned. This application Dec. 5, 1969, Ser. No. 882,574. The portion of the term of this patent subsequent to Oct. 6, 1987, has been disclaimed.**

**Int. Cl. H02b** *1/02*

**U.S. Cl. 317—101 DH** **13 Claims**

Plastic member, such as connector housing or printed circuit board supporting member, has mounting means thereon comprising spaced-apart parallel surfaces which are flexible towards each other and capable of undergoing resilient buck-

ling in their own planes. A boss is provided on each surface intermediate its ends and has one side facing one end of the surface. Each boss has a projection extending beyond the one side and towards the one end of the surface. A shoulder is formed adjacent to the end of each surface in opposed rela-



tionship to the boss, these shoulders being spaced from the projections on the bosses by a distance equal to the thickness of the thinnest panel on which the member is to be mounted. If the member is to be mounted on a thicker panel, the surfaces buckle to accommodate the increased thickness.

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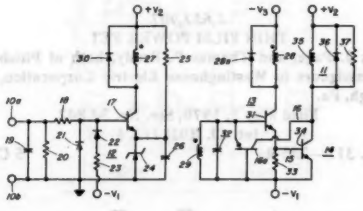
**3,652,900**

## RADIATION TOLERANT RELAY CONTROL SYSTEM

**Theodore H. Evers, Highland, and Eric K. Pritchard, Adelphi, both of Md., assignors to The United States of America as represented by the Secretary of the Navy**

**Filed Aug. 19, 1969, Ser. No. 851,413**
**Int. Cl. H01h** *47/32*
**U.S. Cl. 317—148.5 R** **2 Claims**



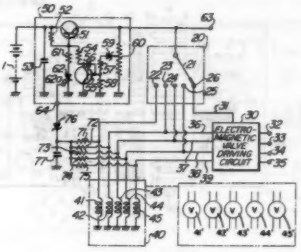
A radiation tolerant relay control system having a threshold amplifier, blocking oscillator and relay driver for actuating a relay winding. A flyback path from the blocking oscillator to the relay winding augments the duty cycle to insure that a predetermined number of input pulses occurring within a time period will energize the relay winding and effect relay operation.

**3,652,901**

## DEVICE FOR PREVENTING SIMULTANEOUS ENERGIZATION OF ELECTROMAGNETIC COILS IN AN AUTOMATIC SPEED CHANGE CONTROL SYSTEM FOR AUTOMOBILES

**Hisato Wakamatsu, Kariya; Akira Kitano, Nagoya, and Hisasi Kawai, Toyohashi, all of Japan, assignors to Nippondenso Kabushiki Kaisha, Kariya-shi, Japan**

**Filed Mar. 16, 1970, Ser. No. 19,780**
**Claims priority, application Japan, Apr. 28, 1969, 44/32999**
**Int. Cl. H01h** *47/00;* **F16h** *57/06*
**U.S. Cl. 317—136** **4 Claims**




A device for preventing the simultaneous energization of electromagnetic coils used for driving the speed change gears in the automatic speed control system for an automobile, which device comprises resistors having one end thereof connected with the positive terminal of electromagnetic coils of electromagnetic valves, the other ends of the resistors being connected in common with the magnetic pole of a constant-voltage diode, and a power control circuit provided between a battery and a load, the positive pole of the constant-voltage diode being connected with the control signal input terminal of the power control circuit, whereby when two or more of the electromagnetic coils are about to be energized simultaneously, a current is passed through the constant-voltage diode to the control signal input terminal of the power control circuit to thereby cut off a current in the power control circuit and therefore the current to electromagnetic coils. The device is simple in circuit arrangement and free of the malfunction resulting from the qualitative irregularity of electrical components in use, or from variations in the ambient temperature or the source voltage.

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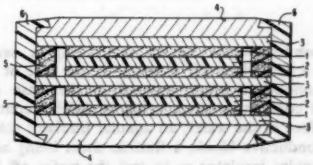
**3,652,902**

## ELECTROCHEMICAL DOUBLE LAYER CAPACITOR

**Burt E. Hart, Red Hook, and Richard M. Peekema, Woodstock, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed June 30, 1969, Ser. No. 837,600**
**Int. Cl. H01g** *9/04*
**U.S. Cl. 317—230** **1 Claim**



An electrolytic double layer capacitor having low series resistance, high capacitance, and low inductance characterized by activated carbon plates of very high true surface to geometric volume ratio separated by a highly porous inert

spacer as thin as 0.0005 inch, impregnated with highly concentrated electrolytes such as KOH or $H_2SO_4$.

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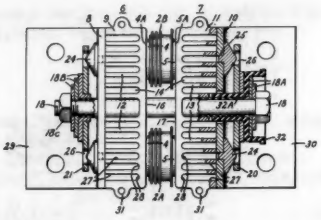
**3,652,903**

**FLUID COOLED PRESSURE ASSEMBLY**

**Lars O. Eriksson, West Chester, and Daniel B. Rosser, Springfield, both of Pa., assignors to General Electric Company**

**Filed Feb. 1, 1971, Ser. No. 111,237**
**Int. Cl. H01l *3/00, 5/00***
**U.S. Cl. 317—234 R** **4 Claims**



Disclosed is a cooled pressure assembly for applying clamping pressure to a plurality of semiconductor rectifiers and for electrically connecting them in parallel. The pressure is applied via a pair of heat dissipating electrodes disposed on opposite sides of the rectifiers. Each electrode contains a plurality of heat dissipating fins which make up a plurality of cooling fluid ducts immediately adjacent the rectifiers. Clamping force exciting means are provided to center the clamping forces axially on the rectifiers and to apply them through the electrodes and the fins therein contained to the rectifiers.

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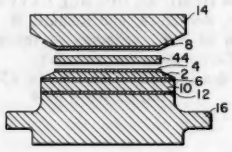
**3,652,904**

**SEMICONDUCTOR DEVICE**

**Kazusaburo Takahashi; Takeshi Sasaki; Hisauke Takeuchi; Keiichi Morita, and Tadatoshi Toda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Mar. 31, 1970, Ser. No. 24,146**
**Claims priority, application Japan, Mar. 31, 1969, 44/23840**
**Int. Cl. H01l *5/02***
**U.S. Cl. 317—234 M** **24 Claims**



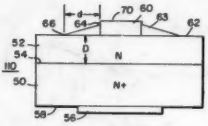
A semiconductor device comprising a semiconductor wafer, a base electrode soldered to one face of the wafer, a first conductive block secured to the base electrode, a second conductive block being in slidable contact with the other face of the wafer, an annular insulator soldered to the first conductive block, a flexible sheet being so secured to the annular insulator as to seal the wafer off from the atmosphere, and means for compressing the conductive blocks to the wafer, characterized in that a hard and thin metallic film is formed on the surface of the second conductive block, whereby a sticking caused between the second conductive block and the wafer can be prevented.

**3,652,905**

**SCHOTTKY BARRIER POWER RECTIFIER**

**Derrick J. Page, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed May 26, 1970, Ser. No. 40,625**
**Int. Cl. H01l *9/00***
**U.S. Cl. 317—234 R** **5 Claims**



This disclosure relates to a Schottky barrier semiconductor device in which the anode contact is surrounded by a tapered layer of a high resistivity, high work function material.

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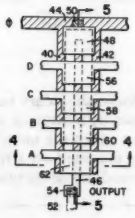
**3,652,906**

**MOSFET DECODER TOPOLOGY**

**Alton O. Christensen, 8906 Valley View Lane, Houston, Tex.**

**Filed Mar. 24, 1970, Ser. No. 22,195**
**Int. Cl. H01l *11/14, 19/00***
**U.S. Cl. 317—235** **5 Claims**



The internal capacitance of parallel-gate IGFET structures such as FARMOST NOR gates is substantially reduced by giving the gated area of the substrate a U-shaped configuration so that each gate electrode extends from one leg of the source or drain diffusion to the other leg of the same diffusion across the other diffusion and two gated substrate areas, forming in effect a pair of parallel-connected IGFETS. The reduced capacitance permits the use of much smaller devices requiring much less drive current for the same output current.

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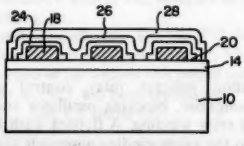
**3,652,907**

**THIN FILM POWER FET**

**Derrick J. Page, and Thomas P. Brody, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed May 5, 1970, Ser. No. 34,842**
**Int. Cl. H01l *11/14***
**U.S. Cl. 317—235 R** **5 Claims**



This disclosure is concerned with a thin film, power field effect transistor having a power dissipation capability of 80 watts/cm.$^3$. The transistor has a thin film interdigitated

source and drain used in conjunction with a thick film source and drain leads. The thick film source and drain leads essentially eliminates negative feedback resulting from a voltage drop in the source and drain.

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**3,652,908**

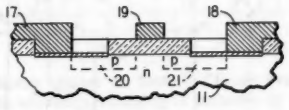
**FABRICATION OF INSULATED GATE FIELD-EFFECT TRANSISTORS INVOLVING ION IMPLANTATION**

**Martin P. Lepselter, New Providence, and Alfred U. MacRae, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Original application Feb. 4, 1969, Ser. No. 796,404, now Patent No. 3,590,471, dated July 6, 1971. Divided and this application Sept. 21, 1970, Ser. No. 73,719**

**Int. Cl. H01l *11/14***

**U.S. Cl. 317—235** **3 Claims**




An insulated gate field-effect transistor is made which utilizes both Schottky barrier connections and ion-implanted zones. The resultant structure incorporates source and drain zones, which are formed by ion implantation and whose spacing is fixed by the gate electrode, and source and drain electrodes which make ohmic connection to the implanted source and drain zones and rectifying connections to unimplanted material.

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**3,652,909**

**BRUSHLESS STEPPING MOTOR**

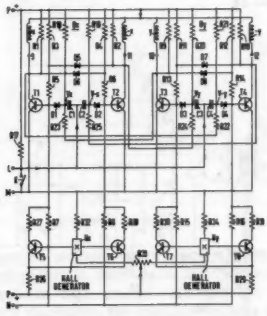
**Erich Rainer, Duisburg-Grossenbaum, and Gerhard Kroger, Veitsbronn, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

**Filed Apr. 15, 1970, Ser. No. 28,868**

**Claims priority, application Germany, Apr. 17, 1969, P 19 19 442.4**

**Int. Cl. H02v *29/00***

**U.S. Cl. 318—254** **1 Claim**




Each of a plurality of switching transistors is connected to a corresponding one of the rotor windings of a brushless stepping motor. A control circuit coupled to the windings controls the windings so that the rotor rotates stepwise and supplies control pulses to the transistors. The switching transistors are mutually displaced by 180° and are connected in a pair of bistable multivibrator circuits which change their condition alternately after each of the control pulses. The control circuit switches the bistable multivibrator circuits to a preferred condition corresponding to the instantaneous position of the rotor after an interruption of the supply voltage.

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**3,652,910**

**AUTOMATIC CONTROL DEVICE FOR THE REGENERATION OF ION-EXCHANGE RESINS**

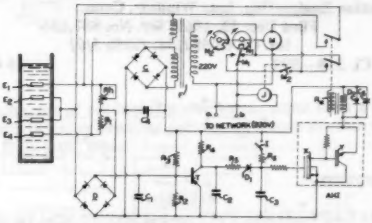
**Jean Louis Urbain, 33 rue du Bierchamps, Marcinelle, Belgium**

**Filed Sept. 11, 1969, Ser. No. 857,143**

**Claims priority, application Belgium, June 18, 1969, 75,521; Sept. 23, 1968, 721,240**

**Int. Cl. B01d *15/04, 15/06***

**U.S. Cl. 318—445** **6 Claims**




A device for automatically controlling the regeneration of an ion-exchange resin. Two pairs of electrodes are spaced in the resin, one above the other. A variation in capacitance or resistance between the pairs, due to change in ion content of the resin actuates a relay which initiates regenerization. A diode and a strong capacitor retard the relay to avoid the accumulation of false information.

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**3,652,911**

**SWITCHGEAR FOR ELECTRICALLY OPERATED WINDOWS OF VEHICLES, ESPECIALLY MOTOR VEHICLES**

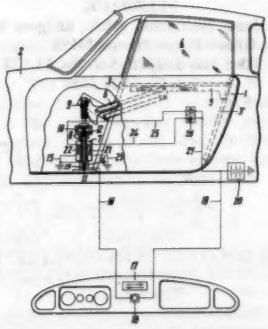
**Wolfhelm Gorissen, Stuttgart, Germany, assignor to Firma Dr.-Ing.h.c.f. Porsche K.G., Stuttgart-Zuffenhausen, Germany**

**Filed June 9, 1970, Ser. No. 44,700**

**Claims priority, application Germany, June 19, 1969, P 19 31 169.4**

**Int. Cl. H02p *7/00***

**U.S. Cl. 318—474** **11 Claims**



Switchgear for electrically operated windows of vehicles, especially motor vehicles, wherein the drive motor is controlled by means of a switch arranged within the passenger compartment. The switchgear includes a slipping clutch pro-

vided with a safety device which reacts to an unacceptably high friction or resistance to the movement of the window by interruptions of the driving force. The switchgear amplifies the moment of movement of the windows through a safety switch arranged on an instrument panel in the vehicle. The slipping clutch is arranged between the drive shaft of the drive motor and the window-lifting linkage. The slipping clutch is capable of clutching through a bridging member controlled by a relay which is, in turn, controlled by the safety switch.

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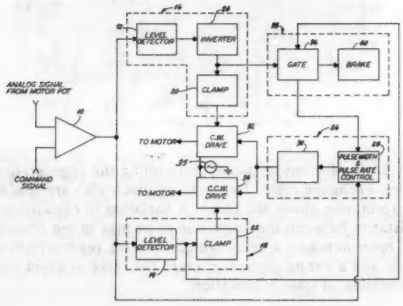
**3,652,912**

## MOTOR CONTROLLER

**Michael P. Bordonaro, Middletown, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.**

**Filed Dec. 22, 1969, Ser. No. 887,156**
**Int. Cl. G05f *1/08*; G05b *5/01***
**U.S. Cl. 318—599** **15 Claims**




A polyphase bidirectional control system suitable for use with AC motors of the squirrel cage type. In response to applied actual and desired position signals, the present invention generates a position error signal and a motor speed control signal; the speed control signal having a variable pulse width and pulse repetition rate. The control signal is employed to supervise the application of power to the motor to be controlled while the position error signal is employed to control the direction of operation of the motor.

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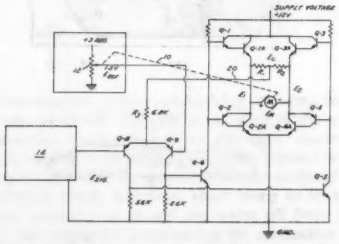
**3,652,913**

## CONTROL SYSTEM INCLUDING COMMON MODE FEEDBACK

**Robert D. Leland, Southfield, Mich., assignor to George M. Holley, Jr., Grosse Pointe Shores, Mich.**

**Filed July 1, 1970, Ser. No. 51,627**
**Int. Cl. G05f *1/00***
**U.S. Cl. 318—678** **6 Claims**




In a differentially operating control system a common mode feedback circuit is described which provides automatic compensation of the quiescent operating point despite variations in component values and semiconductor parameters. The circuit is illustrated in a control system for differentially operating a load, such as a DC motor, in accordance with the difference between a pair of input signals to accurately position the shaft of the motor in respect of such difference.

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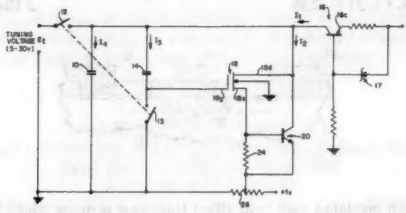
**3,652,914**

## VARIABLE DIRECT VOLTAGE MEMORY CIRCUIT

**Friedrich Johann Krausser, Jericho, N.Y., assignor to Emerson Electric Co., St. Louis, Mo.**

**Filed Nov. 9, 1970, Ser. No. 87,901**
**Int. Cl. G11c *11/24***
**U.S. Cl. 320—1** **2 Claims**




A variable direct-voltage memory circuit comprises a storage capacitor which can be connected in parallel by a switch with a reference capacitor having an extremely long time constant. When the switch is open, the difference in voltage between these two capacitors can be determined and used to control a shunt current regulator to regulate the flow of current to the storage capacitor.

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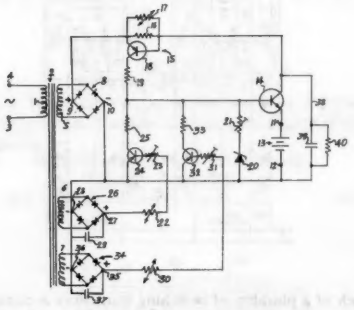
**3,652,915**

## BATTERY CHARGING SYSTEM WITH MEANS FOR SENSING CURRENT, VOLTAGE, GASSING AND TEMPERATURE

**Klaus Eberts, 4, Grunwaldtrg, Budingen/Hessen, Germany**

**Continuation-in-part of application Ser. No. 752,220, Aug. 13, 1968, now abandoned. This application Apr. 2, 1970, Ser. No. 25,045**
**Int. Cl. H02j *7/04***
**U.S. Cl. 320—31** **4 Claims**



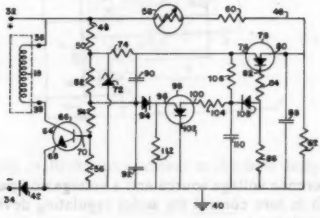
A battery charging system has electronic control means for reducing the charging current in response to attainment of a predetermined battery terminal voltage, a predetermined temperature of the battery and/or a predetermined gassing rate of the battery, and for terminating the charging current when same falls below a predetermined low limit.

3,652,916

## BATTERY CHARGE PROGRAMMERS

Gray C. Ballman, St. Louis County, Mo., assignor to Chargematic, Inc.

Filed May 28, 1970, Ser. No. 41,423
Int. Cl. H02j 7/04
U.S. Cl. 320—35 6 Claims



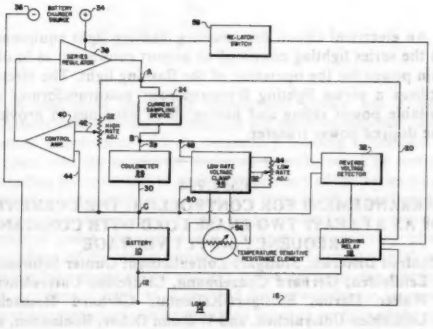
The disclosure relates to Battery Charge Programmers which permit automatic charging of batteries by regulating the overcharge time of the battery being charged and which contain an overriding charge time limiter, to limit the total amount of time the battery is charged, independently of the state of charge.

3,652,917

## BATTERY CHARGING SYSTEM USING A COULOMETER AS A LOGIC DEVICE

Carl E. Biggs, Niagara Falls, N.Y., assignor to Textron Inc., Providence, R.I.

Filed Feb. 24, 1970, Ser. No. 13,624
Int. Cl. H02j 7/00
U.S. Cl. 320—45 10 Claims



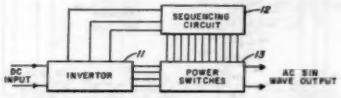
A rechargeable storage battery power supply system in which a coulometer is used as a logic device to provide transition between high charge rate and low charge rate. During battery discharge, the coulometer may act as a logic device to disconnect the load from the battery after a predetermined time integral of current is drawn from the battery. The charging current is applied in reverse direction through the coulometer and when the coulometer reaches its high impedance state in the charging direction a trickle charge is bypassed to the battery. The trickle charge control includes a thermistor responsive to battery temperature. An additional circuit is provided which acts to provide constant voltage float charge after the battery has been fully charged, and which additional circuit also uses the coulometer as a logic element.

3,652,918

## SWITCHING INVERTER WITH SINE WAVE OUTPUT

Joseph M. Marzolf, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the United States Navy

Filed Sept. 30, 1970, Ser. No. 76,910
Int. Cl. H02m 1/12
U.S. Cl. 321—9 R 2 Claims



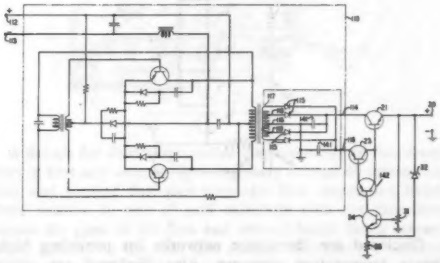

A technique of producing a sine wave output from a solid state inverter using Triacs as switches to supply the sine wave output from a DC input.

3,652,919

## BASE REACH-THROUGH ACTIVE SERIES VOLTAGE REGULATOR

Thomas George Harrigan, Denville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 30, 1971, Ser. No. 129,349
Int. Cl. H02m 7/20
U.S. Cl. 321—18 5 Claims



The pass transistor of this series regulator supplies current at a regulated voltage only slightly below its unregulated supply voltage. The driver transistor, driven by the feedback loop, is supplied from a higher voltage source. During periods when the pass transistor cannot supply the load because its source voltage is too low, the driver transistor supplies the load through the base-emitter junction of the pass transistor without affecting the regulation.

3,652,920

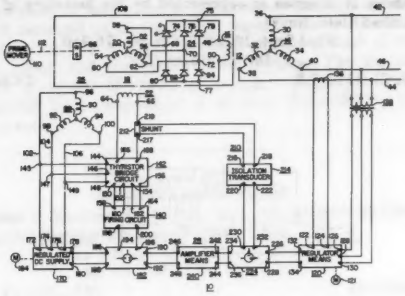
## REGULATED EXCITER-GENERATOR ELECTRICAL POWER APPARATUS RESPONSIVE TO EXCITER FIELD CURRENT

William H. South, McKeesport, and Frederick W. Keay, Irwin, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 3, 1970, Ser. No. 94,844
Int. Cl. H03p 9/14
U.S. Cl. 322—19 7 Claims

Regulated electric power apparatus including a dynamoelectric machine and exciter. A control feedback

loop responsive to the parameter to be regulated is modified by a supplementary negative feedback loop responsive to the



exciter field current, which forces current into the field and reduces the effective exciter time constant.

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**3,652,921**

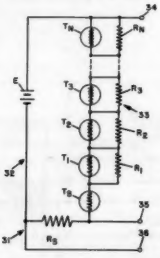
**LINEARIZED THERMISTOR NETWORKS**

**Lloyd N. Nye, 363 Concord Street, Framingham, Mass.**

**Filed July 2, 1970, Ser. No. 51,995**

**Int. Cl. G05f 3/00**

**U.S. Cl. 323—69** **21 Claims**



Disclosed are thermistor networks for providing highly linear temperature response. Also disclosed are critical ranges of component value ratios that optimize performance linearity. Particularly described is a network composed of an electrical energy source and source resistor $R_s$ connected across a thermistor circuit including a single thermistor connected in series with another thermistor shunted by a fixed value resistor $R_1$. Optimization is achieved for an important segment of operating temperatures by employing a ratio of $R_1/R_s$ in the range between one and four.

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**3,652,922**

**CONSTANT CURRENT SERIES REGULATOR WITH CONTROL OF BIAS CURRENT ENERGIZING CONTROL CIRCUIT OF THE REGULATOR**

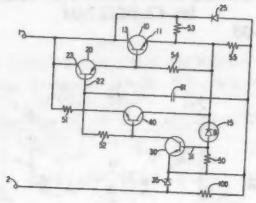
**Robert Joseph Healey, Morris Township, Morris County, and Helmut Stocker, Randolph Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Nov. 18, 1970, Ser. No. 90,731**

**Int. Cl. H02j 1/04; G05f 1/56**

**U.S. Cl. 323—4** **5 Claims**

The regulation of the current output of a series type current regulator is significantly improved by closely regulating the bias currents required by the control and reference elements of the regulator. These regulated bias currents may be coupled to the output circuit and form part of the output load current. The regulated bias currents are utilized to ener-



gize a reference voltage source and a voltage comparison circuit which in turn control the series regulating device of the current regulator.

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**3,652,923**

**TRANSFORMER-COUPLING CIRCUIT**

**Clarence B. Knudson, Inglewood, Calif., assignor to Hughey & Phillips, Inc.**

**Filed Oct. 12, 1970, Ser. No. 80,061**

**Int. Cl. G05f 3/06**

**U.S. Cl. 323—6** **5 Claims**

An electrical circuit for coupling flashing light equipment to the series lighting circuit of an airport runway so as to obtain power for the operation of the flashing light. The circuit utilizes a series lighting ferro-resonant autotransformer of suitable power rating and having three windings to provide the desired power transfer.

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**3,652,924**

**ARRANGEMENT FOR CONTROLLING THE CURRENT OF AN AT LEAST TWO-PHASE LOAD WITH CONSTANT FREQUENCY SUPPLY VOLTAGE**

**Manfred Dieterich, Stuttgart-Zuffenhausen; Gunter Schirmer, Leinfelden; Gerhard Conzelmann, Leinfelden-Unteraichen; Walter Harlin, Stuttgart-Kaltental; Gerhard Haustein, Leinfelden-Unteraichen, and Wilhelm Ocker, Bonlanden, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany**

**Filed Feb. 20, 1970, Ser. No. 13,135**

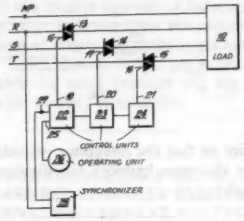
**Claims priority, application Germany, Feb. 21, 1969, P 19 08 726.4**

**Int. Cl. G05f 1/56**

**U.S. Cl. 323—24** **17 Claims**

An arrangement for the operation of a polyphase load from an alternating current source through the control of triacs. One triac is connected in each phase of the source connected to the load. The control electrodes of the triacs are controlled through a primary stage having a variable time delay in the form of a monostable multivibrator with RC network of variable resistance. A synchronizing device is connected between the primary stage and one phase of the alternating current source. Secondary control stages with fixed time delay elements receive signals from the primary stage or

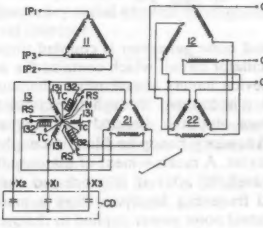
from other secondary stages to control the firing of the triacs. The firing pulses are generated through resetting of the monostable multivibrators present as the time delay elements in the control stages.




## 3,652,925
## POLYPHASE TRANSFORMER DEVICE WHOSE TAPS ARE CHANGEABLE WHEN LOADED

Masaki Yamana, Kawasaki, Japan, assignor to Fuji Denki Seizo Kabushiki Kaisha, Kawasaki-shi, Japan

Filed Nov. 30, 1970, Ser. No. 93,705
Claims priority, application Japan, Nov. 28, 1969, 44/95517
Int. Cl. G05f 3/04
U.S. Cl. 323—43.5 R 2 Claims



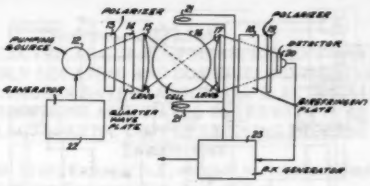
A polyphase regulating transformer device has a main transformer, a tertiary winding in the main transformer and a series transformer with its secondary winding connected in series with the output of the main transformer. The tertiary winding is connected to excite the primary of the series transformer, and is itself composed of a fixed winding section and a tapped winding section both being connected in series at a neutral point through a tap changer; the primary phase windings of the series transformer are not provided with any interphase connections and are insulated from one another. A condenser bank is connected for power factor improvement across terminals of the fixed winding section of the tertiary.

## 3,652,926
## OPTICAL PUMPING MAGNETOMETERS

Henri Brun, Paris, France, assignor to Thomson-CSF

Filed Feb. 25, 1970, Ser. No. 13,970
Claims priority, application France, Mar. 6, 1969, 69/06240
Int. Cl. G01r 33/08
U.S. Cl. 324—0.5 R 5 Claims

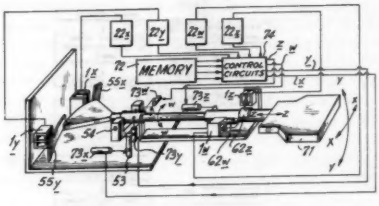
The invention relates to optical pumping magnetometers, wherein an alkali vapor filling an absorption cell is optically pumped by means of a pumping source which provides light having two spectrum lines building up a doublet. The magnetometer according to the invention uses a cell whose walls are internally lined with a layer preserving the alignment of the alkali atoms. Improved detection of the R.F. lines is carried out with a birefringent plate converting said two spectrum lines radiations supplied by said cell with the same circular polarization into radiations rectilinearly polarized in mutually perpendicular directions.




## 3,652,927
## VECTOR DISPLACEMENT DEVICE

Saburo Uemura, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 24, 1970, Ser. No. 22,280
Claims priority, application Japan, Apr. 9, 1969, 44/27883
Int. Cl. G01r 33/00
U.S. Cl. 324—34 D 5 Claims




A device for detecting relative displacements of two members in first and second right-angularly related directions has first and second dual-gap magnetic flux responsive heads fixed relative to one of said members with the directions across the gaps of the first and second heads being respectively parallel to the first and second directions of relative displacement, first and second magnets fixed relative to the other member and being disposed adjacent the first and second heads with each magnet being magnetized in the direction across the gaps of the adjacent head, and circuits connected with the heads to provide electrical outputs that are characteristic of the magnetic flux received by the respective heads from the adjacent magnets and hence correspond in magnitude and polarity to relative displacements of the members in the first and second directions from a predetermined position.

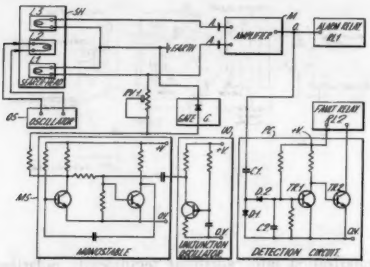
## 3,652,928
## METHOD AND APPARATUS FOR TESTING ELECTRICAL DETECTION SYSTEMS

John William Brian Mansfield, 144 A Commercial Way, London S.E. 15, England

Filed July 7, 1969, Ser. No. 839,507
Claims priority, application Great Britain, July 10, 1968, 32,917/68
Int. Cl. G01r 35/00
U.S. Cl. 324—34 R 15 Claims

A method of testing a detection system having inductively coupled primary and secondary coils with a switching device connected to the output. An impedance is switched into the

secondary coil circuit to cause a change in output which is insufficient to actuate the switching means and an alarm sen-




ses any absence of change in output, indicating that there is a fault in the detection system.

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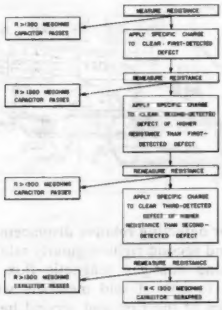
**3,652,929**

## METHOD FOR HEALING SHORT CIRCUITS IN CAPACITORS

**Robert Holbrook Cushman, Princeton, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.**

**Filed Feb. 9, 1970, Ser. No. 9,582**
**Int. Cl. G01r** *31/02, 27/26*
**U.S. Cl. 324—51** **4 Claims**


MEASURE RESISTANCE
APPLY SPECIFIC CHARGE TO CLEAR FIRST-DETECTED DEFECT
REMEASURE RESISTANCE
APPLY SPECIFIC CHARGE TO CLEAR SECOND-DETECTED DEFECT OF HIGHER RESISTANCE THAN FIRST-DETECTED DEFECT
REMEASURE RESISTANCE
APPLY SPECIFIC CHARGE TO CLEAR THIRD-DETECTED DEFECT OF HIGHER RESISTANCE THAN SECOND-DETECTED DEFECT
REMEASURE RESISTANCE

Resistance of self-healing capacitors is measured to detect short circuits of lowest resistance. Electrical charge of relatively high current for relatively short time is applied to burn out lowest resistance short circuits. Resistance is again measured to detect short circuits of higher resistance. Electrical charge of relatively lower current for relatively longer time is applied to burn out higher resistance short circuits. Resistance is again measured to detect short circuits of still higher resistance. Electrical charge of relatively still lower current for relatively still longer time is applied to burn out still higher resistance short circuits.

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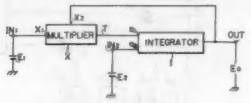
**3,652,930**

## RATIO MEASURING APPARATUS

**Takashi Sugiyama; Satoshi Kurata, and Hisao Nakane, all of Tokyo, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan**

**Filed Mar. 2, 1970, Ser. No. 15,500**
**Claims priority, application Japan, Mar. 6, 1969, 44/17060; 44/17061; Sept. 26, 1969, 44/76784**
**Int. Cl. G01r** *27/00;* **G06g** *7/16*
**U.S. Cl. 324—57** **7 Claims**

Ratio measuring apparatus adapted to measure various parameters of impedance elements is comprised by a multiplier energized by a divisor signal, and an integrator supplied with a dividend signal and the output from the multiplier. A portion of the output from the integrator is fed back to




the multiplier so that the integrator provides an output proportional to the ratio between the dividend signal and the divisor signal.

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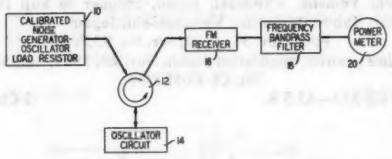
**3,652,931**

## INNATE OSCILLATOR NOISE DETERMINATION

**James Gross Josenhans, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.**

**Filed Oct. 2, 1970, Ser. No. 77,658**
**Int. Cl. G01r** *27/00*
**U.S. Cl. 324—57** **8 Claims**




A calibrated noise generator is coupled through a circulator to an oscillator circuit which contains the active negative resistance device having innate noise characterized by $M_o$. The oscillator is coupled through the circulator to an FM receiver whose output is directed to a frequency bandpass filter. The frequency bandpass filter is coupled to a power measuring meter. A measurement of the output power of the oscillator waveform after it is processed through the FM receiver and frequency bandpass filter is made with essentially no external noise power applied to the oscillator circuit. The noise signal from the noise generator is then increased until the output power meter reading is double the initial measurement. At this point the innate noise, $M_o$, of the active negative resistance device is known.

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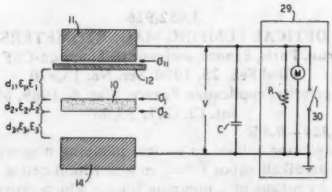
**3,652,932**

## METHOD AND APPARATUS FOR MEASUREMENT OF SURFACE CHARGE OF AN ELECTRET

**Gerhard Martin Sessler, Summit, and James Edward West, Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed July 30, 1970, Ser. No. 59,531**
**Int. Cl. G01n** *31/02*
**U.S. Cl. 324—72** **12 Claims**




Electret surface charge is measured accurately and in a reproducible fashion by supporting an electret between fixed electrodes positioned at a finite distance from the electret,

one at ground potential and the other employed as a voltage probe. A conductive shutter is interposed between the electret and the probe. A capacitor connecting the electrodes is discharged and the shutter opened to induce a charge on the probe. This charge is drawn from the capacitor and the voltage thus generated across the capacitor is measured with an electrometer. Since electrode spacing is fixed, repeated measurement yields the same measure and the charges on different samples are directly comparable.

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**3,652,933**

## APPARATUS FOR PRODUCING A SIGNAL WHEN A SELECTED PHASE RELATIONSHIP EXISTS BETWEEN TWO ALTERNATING CURRENT VOLTAGES OF DIFFERENT FREQUENCIES

**Tibor Rubner, Pittsburgh; Andre Wavre, Monroeville, and John H. Bednarek, Murrysville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Original application Jan. 4, 1968, Ser. No. 695,684. Divided and this application Dec. 23, 1969, Ser. No. 889,824**

**Int. Cl. G01r** *23/00, 25/00*

**U.S. Cl. 324—82** **6 Claims**

A signal is produced when a selected phase relationship exists between two alternating current voltages of different frequencies by converting the alternating current waveforms to square waves, combining the square waves to produce a rectangular waveform, and utilizing the rectangular waveform to produce a triangular beat frequency signal having a linear relationship between phase difference and time, and a level detector has the triangular beat frequency signal applied thereto and produces an output signal when the triangular beat frequency signal exceeds in amplitude a selected level in the level detector.

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**3,652,934**

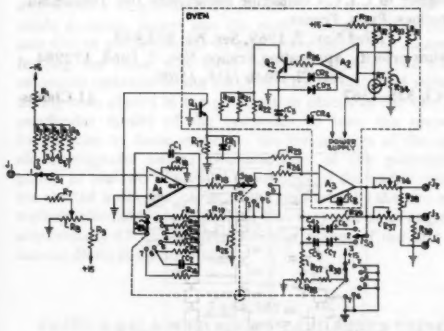
## LOG/LINEAR ELECTROMETER

**Joseph W. Paljug, Falls Church, and Samuel S. Brody, Springfield, both of Va., assignors to American Standard Inc., Falls Church, Va.**

**Filed Aug. 5, 1969, Ser. No. 847,694**

**Int. Cl. G01r** *15/08, 15/10*

**U.S. Cl. 324—115** **12 Claims**



A high impedance, solid state log-linear amplifier (electrometer) of drift free repeatable character includes a multiple range linear amplifier and a logarithmic amplifier continuously adjustable to accept several decades of input current. The overall unit includes an internal calibration source and has a pair of output ports which are separately adjustable relative to the input current to provide dual readout for a single input as where one readout is to be interfaced into a computer while the other readout is to provide a visual entry on a strip chart recorder.

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**3,652,935**

## ELECTRICAL CURRENT MEASUREMENT AND RAPIDLY LOCATING AND POSITIVELY IDENTIFYING CATHODES HAVING ABNORMAL ELECTRICAL CONDITIONS ASSOCIATED THEREWITH IN AN ELECTROLYTIC COPPER REFINING PROCESS TANKHOUSE

**Frank D. Shaw, Rumson, N.J., assignor to American Smelting and Refining Company, New York, N.Y.**

**Filed Jan. 7, 1970, Ser. No. 1,108**

**Int. Cl. G01r** *1/22, 33/00*

**U.S. Cl. 324—127** **35 Claims**

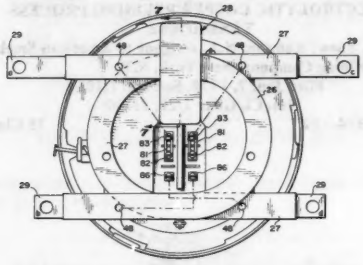
Cathodes having abnormal electrical conditions associated therewith in an electrolytic copper refinery tankhouse are rapidly and positively identified to enable the early remedying of the abnormal condition or conditions, for instance short circuited cathodes or poor contacts, by closing the normally open, cathode bar receptive, pivotally mounted, automatically closeable and automatically openable jaws of a sensing head of an electrical current measuring instrument, or of the sensing heads of a plurality of current measuring instrument units depending from a common supporting means of a current measuring apparatus, about one or more of a plurality of spaced apart cathode bars in the tankhouse and from which the cathodes are suspended and immersed in the electrolyte. The sensing head jaws are closed about the cathode bars by lowering the instrument or apparatus whereby shoes of the instrument's operating mechanism are forcefully applied against the cathode bar or bars due to the weight of instrument or apparatus parts, thereby automatically closing the jaws of the sensing head or heads to substantially encompass the cathode bar or bars. The current passing through each cathode bar is measured by utilizing the magnetic field created by the current passing through the cathode bar to induce a measurable e.m.f. and a measurable electrical current in conductive coils on nonmagnetic cores of the sensing head jaws in a preferred embodiment. The current measurement value for the cathode bar or each of the cathode bars is compared with a predetermined desired current measurement value for its suspended cathode thereby positively identifying any cathode or cathodes having an abnormal electrical condition or conditions associated therewith.

3,652,936

## SELF-CONTAINED WATT-HOUR METERS FOR EXCEEDINGLY HEAVY LOADS

George N. Burkhart, Jr., Brookston, Ind., assignor to Duncan Electric Company, Inc.

Filed Dec. 4, 1969, Ser. No. 882,013
Int. Cl. G01r 11/02, 35/04
U.S. Cl. 324—137 14 Claims



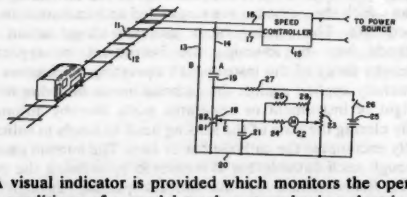
A watt-hour meter has in its base the circular core of a current transformer, wound with the secondary coil, this coil being connected to the current coil of the meter driving unit. The heavy load-carrying conductors extending through this core as its primary winding are carried by the base and are in the form of oppositely facing "U" bars. A special meter box and terminal block facilitates the connecting of this combination in the circuit being measured. Alternatively it may be mounted at a different position, not in the circuit, in which case closing the cover causes the display of words indicating that it is not in service. Shiftable connection links reverse voltage connections in case the supply and load conductors are interchanged from the more usual arrangement, and also facilitate testing. The service connectors are especially suited for very heavy service conductors. Calibration is of the total self-contained meter, i.e., with current transformer as a part thereof.

3,652,937

## SPEED AND FAULT INDICATOR FOR A MODEL VEHICLE

William L. Garrott, 2119 S.W. 44th Avenue, Gainesville, Fla.

Continuation-in-part of application Ser. No. 795,176, Jan. 30, 1969, now abandoned. This application Nov. 2, 1970, Ser. No. 86,255
Int. Cl. G01p 3/48
U.S. Cl. 324—168 10 Claims



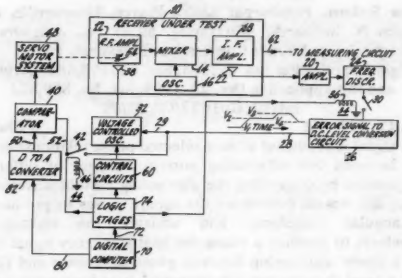

A visual indicator is provided which monitors the operating conditions of a model track system having electrically propelled vehicles and simultaneously provides an indication of the speed of the vehicle on the trackway and of any faulty conditions that may exist along the tracks. A semiconductor transistor circuit separates ripple voltage produced by commutation in the electrical motor that propels the vehicle from the full wave rectified voltage of the energizing source of the model system. Operation of the transistor circuit in response to ripple voltage drives a meter instrument calibrated to indicate speed of the vehicle, while deflections due to faults provide an indication of a fault at the location of the vehicle on the track.

3,652,938

## DUAL LOOP RECEIVER TUNING AND FREQUENCY TRACKING SYSTEM

Larry Joe Byers, Indianapolis, Ind., and James Maurice Keeth, Columbus, Ohio, assignors to RCA Corporation, New York, N.Y.

Filed June 9, 1970, Ser. No. 44,781
Int. Cl. H04b 1/16
U.S. Cl. 325—363 6 Claims



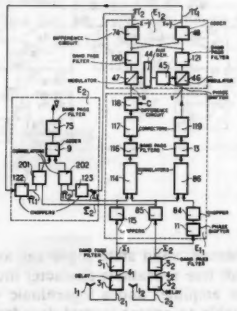

A first servo loop responsive to the beat frequency produced in a receiver automatically tunes an oscillator coupled to the input circuit of the receiver to the receiver frequency. A second servo loop then tunes the receiver to desired frequencies within the receiver band, while the oscillator automatically tracks this tuning. The second loop may include a comparator for comparing voltages indicative of the frequencies to which it is desired to tune the receiver with a voltage employed for tuning the oscillator.

3,652,939

## APPARATUS FOR IMPROVING THE SIGNAL TO NOISE RATIO OF SIGNALS RECEIVED AT TWO ANTENNAS

Georges Levasseur, La Talmouse Par Goussainville, France, assignor to C.I.T.-Compagnie Industrielle Des Telicommunications, Paris, France

Filed Nov. 7, 1969, Ser. No. 874,943
Claims priority, application France, Nov. 7, 1968, 172984
Int. Cl. H04b 1/18, 15/00
U.S. Cl. 325—367 11 Claims



Device for improving the signal/noise ratio $S + B_1$ and $S + B_2$ coming from two aerials, comprising two correlators with

polarity coincidence, whose first inputs receive chopped tensions $x + y$ and $x - y$, $x$ and $y$ being sinusoidal voltages depending respectively on the correlation coefficients of noise $B_1$, $B_2$ and of the said noise put in phase coincidence, and whose second inputs receive chopped tensions $S + B_1$ and $S + B_2$, the required signal being collected at the output of an adder whose inputs are connected to the outputs of the said correlators.

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**3,652,940**

**MICROWAVE BALANCED RECEIVER MIXER**

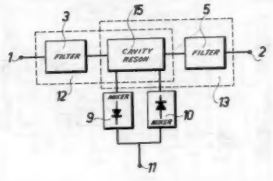
**Gyorgy Reiter; Sandor Szenasi; Bela Toth, and Ferenc Rakosi, all of Budapest, Hungary, assignors to Tavkozlesi Kutato Intezet, Budapest, Hungary**

**Filed Feb. 17, 1970, Ser. No. 12,016**

**Claims priority, application Hungary, Feb. 27, 1969, TA-1007**

**Int. Cl. H04b 1/06**

**U.S. Cl. 325—446** **5 Claims**




The microwave balanced mixer includes two band-pass filters tuned to the frequencies of an input signal and local oscillator signal with means to feed the input and local oscillator signals into a cylindrical cavity resonator as two electromagnetic fields having relative perpendicular polarizations. Means are also provided to couple the cavity resonator to two diode mounts, theses diode coupling means being located on the cylindrical wall of the cavity resonator so that a plane determined by the center of a first of said diode coupling means and the cavity resonator longitudinal axis and a plane determined by the center of a second of said diode coupling means and the cavity resonator longitudinal axis will be perpendicular to each other and to the means for feeding the input and local oscillator signals. The cavity resonator operates in the $TE_{111}$ or $TE_{112}$ modes and includes tuning rods placed in the polarization planes of the two perpendicular modes of the resonator to tune the resonant frequencies to these modes to the frequencies of the input electromagnetic fields. The positions of the polarization planes of the two perpendicular modes of the cavity resonator excited inside the cavity of the resonator by the two electromagnetic fields are chosen so that they will be at angles of substantially 45° to the perpendicular planes of the first and second diode coupling means.

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**3,652,941**

**DOUBLE BALANCED MICROWAVE MIXER USING BALANCED MICROSTRIP BALUNS**

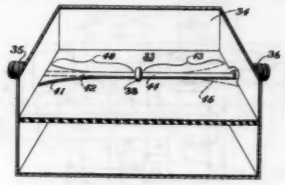
**Donald Neuf, Wantagh, N.Y., assignor to RHG Electronics Laboratory, Inc., Farmingdale, L. I., N.Y.**

**Filed Feb. 24, 1970, Ser. No. 13,436**

**Int. Cl. H04b 1/06**

**U.S. Cl. 325—446** **19 Claims**

A microwave mixer using a double balanced diode bridge arrangement, provided with a signal input, a local oscillator input and an output. Microstrip baluns, having their ground plane metallic strip tapered, are connected between the inputs and the bridge. The diode bridge is assembled in a package wherein all the connections are of substantially




identical lengths, and is placed in a substrate which is suspended in air within a housing.

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**3,652,942**

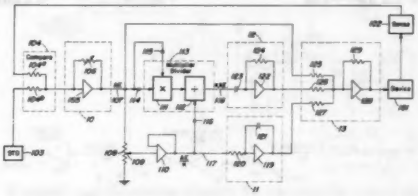
**FEEDBACK CONTROL SYSTEM**

**Ward F. O'Connor, Deanville, N.J., and William George Van Vliet, Greenwich, Conn., assignors to The Lummus Company, Bloomfield, N.J.**

**Filed Jan. 18, 1971, Ser. No. 107,029**

**Int. Cl. G06g 7/18**

**U.S. Cl. 328—127** **21 Claims**



A feedback control system including differentiating means and integrating means is disclosed in accordance with the teachings of the present invention wherein the effective time constants of the differentiating means and the integrating means are simultaneously modified in accordance with a single adjusting means such that said time constants maintain a constant relationship with respect to each other. The single adjusting means includes variable proportioning means for producing a signal proportional to an input signal such that the ratio of proportionality between the produced signal and the input signal is adapted to be altered, and reciprocal means supplied with said input signal such that said relationship is equal to the reciprocal of said ratio of proportionality. The produced signal and the generated signal are applied to the differentiating means and the integrating means whereby the effective time constants thereof are modified in accordance with said ratio of proportionality. The sensitivity of the feedback control system may be modified by second adjusting means.

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**3,652,943**

**APPARATUS INCLUDING DELAY MEANS FOR DETECTING THE ABSENCE OF INFORMATION IN A STREAM OF BITS**

**Albert T. Piccirilli, Medfield; Frederick P. Cochrane, Needham, and Eugene S. Redner, Framingham, all of Mass., assignors to Honeywell Inc., Minneoplis, Minn.**

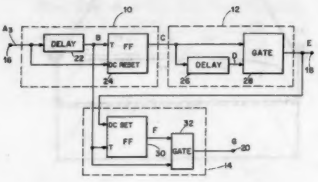
**Filed May 4, 1970, Ser. No. 34,285**

**Int. Cl. H03k 5/18**

**U.S. Cl. 328—120** **20 Claims**

Herein is revealed a missing information bit detector which is utilized in reading either double frequency or phase encoded information. A first circuit receives the information stream of clock and data bits and generates a series of pulses

whose width is dependent on the delay of the first circuit, the time between successive bits and the duration of such bits received at its input. A low pass digital filter is coupled to receive such pulses and generates an output signal indicative




of a missing bit when the width of such pulses in greater than a specified value. Also revealed is a means for separating the clock and data bits while maintaining a selected phase relationship therebetween.

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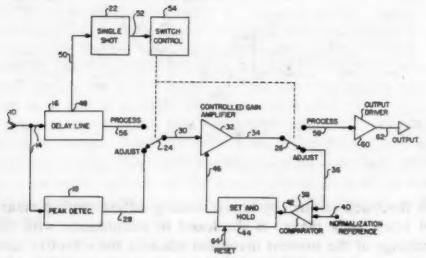
**3,652,944**

**PULSE-CHARACTERISTIC MODIFYING CIRCUIT**

**Lester Richard Querry, Laurel, Md., assignor to The Bunker-Ramo Corporation, Canoga Park, Calif.**

**Filed May 19, 1969, Ser. No. 825,650**
**Int. Cl. H03b** *3/02*
**U.S. Cl. 328—168** **6 Claims**




A circuit for utilizing a first characteristic pf a single pulse to control the modifying of a second characteristic of the pulse without causing any pulse distortion. The pulse is delayed while a pseudo-pulse is generated having the same first characteristic as the pulse and the pseudo-pulse is utilized to set a second-characteristic modifying means. When the modifying means has been set the delayed pulse is applied through the modifying means.

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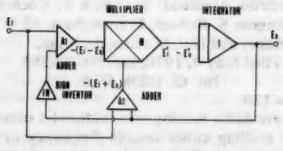
**3,652,945**

**CIRCUITS FOR CONVERTING THE EFFECTIVE VALUE OF INPUT ELECTRIC SIGNALS INTO DC VOLTAGES**

**Hisao Nakane, and Akihisa Hashimoto, both of Tokyo, Japan, assignors to Yokogawa Electric Works, Limited, Tokyo, Japan**

**Filed Feb. 4, 1971, Ser. No. 112,665**
**Claims priority, application Japan, May 12, 1970, 45/40309**
**Int. Cl. G06g** *7/18;* **H03k** *5/00*
**U.S. Cl. 328—150** **8 Claims**




A circuit for converting the effective value of an input electric signal into a DC voltage comprises an integrator for producing a DC output voltage, a first means for adding the input signal to a signal fed back from the output side of the integrator, a second means for subtracting the signal fed back from the output of the integrator from the input signal, and means for multiplying the output from the first means with the output from the second means for applying the product to the input of the integrator.

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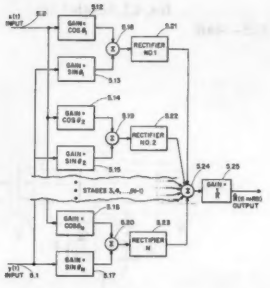
**3,652,946**

**COMPLEX ENVELOPE DETECTOR**

**William F. Acker, St. Petersburg, Fla., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed July 2, 1970, Ser. No. 52,035**
**Int. Cl. H03d** *1/08*
**U.S. Cl. 329—192** **17 Claims**




A substantially phase insensitive complex envelope detector for continuously detecting on an analog basis the amplitude $R(t)$ of a time varying complex vector whose baseband voltage quadrature signals $x(t)$, $y(t)$ are of the form $R(t)=x(t)+jy(t)$. An approximation technique utilizes circuits which project the $x(t)$, $y(t)$ components parallel to vectors at angles $\theta_1$ through $\theta_n$, and summing circuits which combine these projections to give the approximate complex vector $R(t)$. For a high order of $n$ angles the error of $R(t)-R(t)$ is small.

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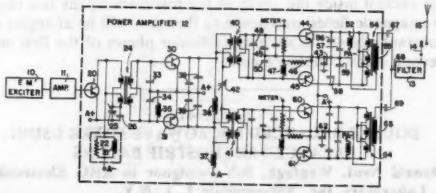
**3,652,947**

**POWER AMPLIFIER INCLUDING PLURALITY OF PUSH-PULL AMPLIFIER SECTIONS HAVING OUTPUTS COUPLED IN PARALLEL**

**Gale C. Hollingsworth, Addison, Ill., assignor to Motorola, Inc., Franklin Park, Ill.**

**Filed Feb. 24, 1970, Ser. No. 13,322**
**Int. Cl. H03f** *3/26*
**U.S. Cl. 330—15** **6 Claims**




A high power semiconductor amplifier, which may be used as the power amplifier of a radio transmitter, includes a plurality of push-pull amplifier sections cooperating to provide the required output power. The amplifier sections are coupled by broadband transformers having ferrite cores and a plurality of inter-wound coils. This affords direct current

isolation of the sections and a high degree of coupling as required for broadband operation and provides stable high gain operation with the signals in the two amplifier sections being in very close phase relationship so that they can be combined in-phase for maximum efficiency. The coupling circuit at the output of the sections includes the secondary windings of the transformers connected in parallel circuit branches extending from the reference potential to the output line to reduce the effect of stray reactances. The amplifier is usable over a wide range of frequencies with a minimum of adjustment.

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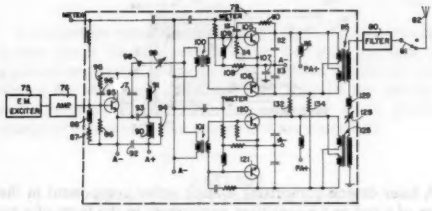
**3,652,948**

## POWER AMPLIFIER INCLUDING PLURALITY OF PUSH-PULL AMPLIFIER SECTIONS COUPLED BY FERRITE MATCHING TRANSFORMERS

**Gary N. Fierstien, Skokie, and Paul A. Talvensaari, Addison, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.**

**Filed Feb. 24, 1970, Ser. No. 13,466**
**Int. Cl. H03f 3/26**
**U.S. Cl. 330—15** **12 Claims**



A high power semiconductor amplifier, which may be used as the power amplifier of a radio transmitter, includes a plurality of push-pull amplifier sections cooperating to provide the required output power. The amplifier sections are coupled by broadband transformers having ferrite cores and a plurality of inter-wound coils. This provides direct current isolation of the sections and a high degree of coupling as required for broadband operation, and also results in stable operation and signals in the two amplifier sections which are in close phase relationship so that the outputs thereof can be combined in-phase for maximum efficiency. The coupling circuit at the input and/or the output of the sections includes windings of the transformers in series with a variable reactance element for tuning the same. The amplifier is usable over a wide range of frequencies with a minimum of adjustment.

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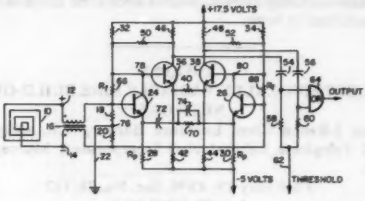
**3,652,949**

## DIFFERENTIAL AMPLIFIER WITH COMMON MODE REJECTION

**Andras I. Szabo, Export, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Dec. 16, 1969, Ser. No. 885,406**
**Int. Cl. H03f 3/68**
**U.S. Cl. 330—30 D** **8 Claims**

Described is a differential amplifier, particularly adapted for use as a sense amplifier for computer core memory units, which has a high common-mode voltage rejection factor. This is accomplished in a symmetrical amplifier configuration, without the need for a constant current source, by applying differential voltages to the bases of a pair of transistors having resistors connected in shunt with their collector-base junctions, resistors connecting their collectors to a common course of potential, resistors connecting their emitters to a common source of potential, and a low impedance path between the emitters of the transistors. By properly proportioning the resistors, the voltages at the collectors of the transistors will remain constant for all common-mode voltages; but, because of the aforesaid low impedance path, will



be different when different voltages are applied to both bases of the transistors.

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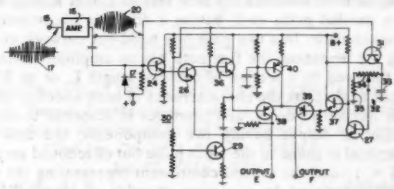
**3,652,950**

## SIGNAL RECONSTRUCTION CIRCUIT

**Francis H. Hilbert, River Grove, Ill., assignor to Motorola, Inc., Franklin Park, Ill.**

**Filed Mar. 9, 1970, Ser. No. 17,436**
**Int. Cl. H03f 3/68; H03k 5/00**
**U.S. Cl. 330—30 D** **7 Claims**



A signal reconstruction circuit for rectangular-wave signal trains is provided in the form of a differential amplifier switching circuit, with an input signal being applied directly to one of the two inputs of the differential amplifier and being applied to a peak detector which establishes a reference voltage. A portion of the reference voltage is applied to the other input of the differential amplifier, thereby varying the switching level of the differential amplifier in accordance with the input signal strength; so that the reconstructed wave form is relatively independent of input signal strength variations.

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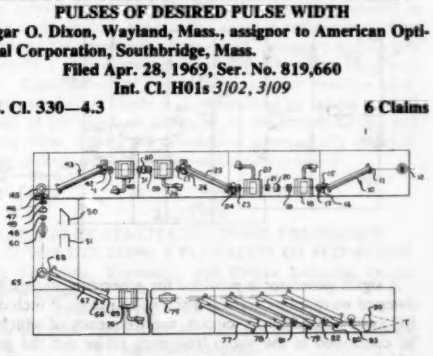
**3,652,951**

## METHOD OF PRODUCING LASER OUTPUT ENERGY PULSES OF DESIRED PULSE WIDTH

**Edgar O. Dixon, Wayland, Mass., assignor to American Optical Corporation, Southbridge, Mass.**

**Filed Apr. 28, 1969, Ser. No. 819,660**
**Int. Cl. H01s 3/02, 3/09**
**U.S. Cl. 330—4.3** **6 Claims**



A system for generating amplified fluorescent energy output pulses of desired width, especially those intermediate in width between those of long and short pulse modes of opera-

tion. The system comprises a low power generator, a means for shaping the generator output into the desired pulse shape and width, a power amplifier, and stabilizing means for the generator-amplifier system, so that undesired oscillations are not permitted to begin.

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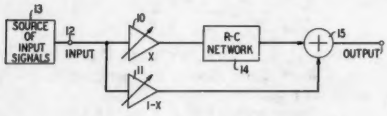
**3,652,952**

## ELECTRONICALLY VARIABLE LINE BUILD-OUT NETWORK

**William I-Hsuan Chen, Laurence Harbor, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed May 19, 1970, Ser. No. 38,752**
**Int. Cl. H03f** *3/60*
**U.S. Cl. 330—57** **5 Claims**




A variable line build-out network for simulating cable lengths from substantially zero feet to L feet having at least two parallel paths each having a different transmission loss characteristic. In a two path line build-out network embodying the invention, the first path has an amplifier having gain X followed by a section of cable of length L, or an RC network to simulate the characteristics of such a section of cable but having no delay, and produces in response to an input pulse an output having two components; the first being identical in shape to the input pulse but of reduced amplitude ($X < 1$) and the second component representing the distortion introduced by a section of cable of length XL. The second path has an amplifier of gain $1 - X$ and where a section of cable was employed in the first path, a pure delay circuit in series therewith. When the outputs of the two paths are combined, the result is a pulse whose shape is identical to that which would have been produced if the input pulse had been transmitted through a cable of length XL.

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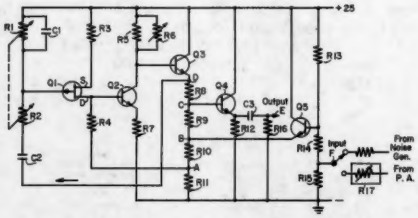
**3,652,953**

## AUDIO OSCILLATOR FOR GENERATING EITHER C.W., DAMPED WAVE TRAINS, OR NARROW BAND NOISE

**John A. Victoreen, 350 N. Maitland Ave., Maitland, Fla.**

**Filed Feb. 27, 1970, Ser. No. 15,093**
**Int. Cl. H03b** *5/26, 29/00*
**U.S. Cl. 331—78** **9 Claims**




A signal generator is provided for generating audible C.W., damped wave trains, narrow band noise pulses. It includes an RC coupled oscillatory circuit, the frequency of which may be controlled in the audio frequency range and the gain of which may be controlled to cause it either to oscillate or bring it close to the oscillation point. Signal injector and removing means is connected to the oscillator circuit input and output, these portions being so connected and proportioned and the phase being such that the injected exciting signal is cancelled from the output signal. The signal generated within the oscillatory circuit is a composite of the injected signal and the signal generated by the oscillatory circuit. The injected signal may be a sawtooth shaped wave which will then cause a damped wave train to appear in the output. It can also be a white noise signal which results in a narrow band noise signal occurring in the output. The band width of the noise signal in the output is determined by the Q of the oscillatory circuit. The Q of the circuit can be measured by generating damped wave signals and measuring the decrement of the signal produced, and therefore the value of the band width of the noise signals passed by the circuit can be determined.

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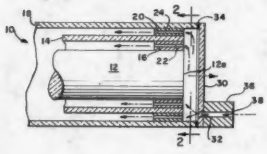
**3,652,954**

## LASER DEVICE

**Elias Snitzer, 177 Hampshire Road, Wellesley, Mass.**

**Filed July 10, 1970, Ser. No. 53,895**
**Int. Cl. H01s** *3/02, 3/04, 3/05*
**U.S. Cl. 331—94.5** **4 Claims**




A laser device comprising a laser active component in the form of a rod and a sensitizer component in the form of a tubular cladding. The laser active component is mounted within the sensitizer component, and at least one surface of the sensitizer component is cooled to provide a more efficient device.

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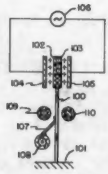
**3,652,955**

## ELECTROMECHANICAL OSCILLATOR USING ELECTRET COUPLING

**Richard E. Cruger, Peekskill, N.Y.; Wilmer C. Anderson, Greenwich; David Earls, Norwalk, and Robert W. Windebank, Fairfield, all of Conn., assignors to General Time Corporation, Phoenix, Ariz.**

**Filed July 30, 1970, Ser. No. 59,653**
**Int. Cl. H03b** *5/30*
**U.S. Cl. 331—116 M** **14 Claims**




An electrically driven oscillator device is provided with one or more electrets for establishing electrostatic coupling between a mechanical oscillating element and an electrical drive. The mechanical oscillating element can comprise a reed, a tuning fork, a pendulum, or a hair-spring balance wheel. The electrical drive can be an AC voltage source or an electronic feedback circuit. In electrically driven devices, electrets can be used in both the pickup and driving circuits to eliminate hysteresis. Alternatively, in order to isolate the pickup circuit from the driving circuit, electrets can be used

in only one of these circuits and magnetic arrangements can be used in the other.

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3,652,956

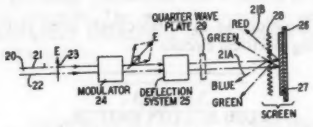
## COLOR VISUAL DISPLAY

Douglas Arthur Pinnow, Berkeley Heights, and Le Grand Gerard Van Uitert, Morris Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Continuation-in-part of application Ser. No. 827,624, May 26, 1969, now abandoned. This application Jan. 23, 1970, Ser. No. 5,324

Int. Cl. H01s *3/10*

U.S. Cl. 332—7.51 21 Claims




A projection visual display system utilizes at least one laser output line in the blue portion of the spectrum together with a phosphor coating which emits at least one additional color. Means for selectively reflecting laser light on the one hand and absorbing it within the phosphor so as to produce phosphor emission on the other hand are described.

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3,652,957

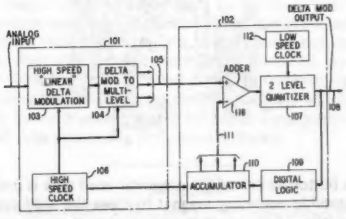
## ADAPTIVE DELTA MODULATOR

David Joel Goodman, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 16, 1970, Ser. No. 98,693

Int. Cl. H03k *13/22*

U.S. Cl. 332—11 D 7 Claims




Analog signals are converted in a fixed step size, high-speed linear delta modulator, and the linear delta modulator signals are accumulated in an up-down counter, or the like. The counter output is conveyed to one terminal of the digital adder of a digital delta modulator. The other adder terminal receives signals from an accumulator connected in the feedback loop of the digital delta modulator. Sequential logic responsive to the adaptive delta modulator output digitally varies the count of the accumulator.

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3,652,958

## LOAD FILTER NETWORK

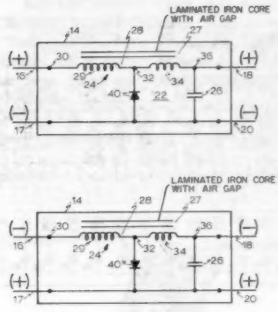
William B. Zelina, Edinboro, Pa., assignor to General Systems, Inc., Erie, Pa.

Filed Apr. 23, 1969, Ser. No. 818,538

Int. Cl. H03h *7/14*

U.S. Cl. 333—79 4 Claims

A new and improved filter circuit arrangement wherein the instantaneous current demand from an ON-OFF voltage source is kept below the current requirements of the load by storing energy in the magnetic circuit of the filter inductance during the ON-time of the source and recovering this stored energy and delivering it to the load during the OFF-time of the source and at a lower voltage and higher current level




than that at which is was stored. To accomplish this a shunt rectifier device is connected with an intermediate tap of the filter inductance and is poled to block current flow from the source.

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3,652,959

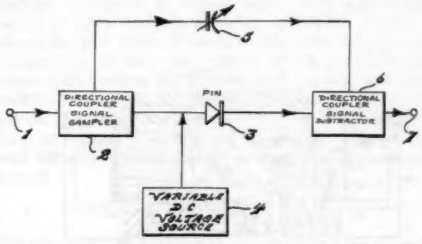
## ELECTRONICALLY VARIABLE RF ATTENUATOR

Hugh W. Denny, Decatur, Ga., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Jan. 26, 1971, Ser. No. 109,865

Int. Cl. H01p *1/22*

U.S. Cl. 333—81 R 4 Claims




An electronically variable RF attenuator is provided in which a pin diode is used as the variable resistance element to control the amplitude of very high frequency signals with essentially a zero degree phase shift over a wide frequency range. Cancellation of the phase-producing reactive components of the pin diode is accomplished by taking a small portion of the signal at the input to the diode, adding $\pi/2$ radians phase shift to the sample and subsequently subtracting the shifted sample from the diode output signal.

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3,652,960

## VARIABLE CAPACITANCE DIODE FREQUENCY SELECTOR UTILIZING A PLURALITY OF FLIP-FLOPS

Yoichi Sakamoto, Toyonaka, and Eisuke Ichinohe, Osaka, both of Japan

Filed May 13, 1970, Ser. No. 36,921

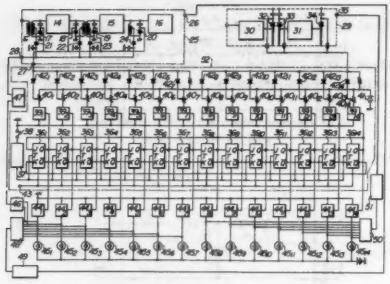
Claims priority, application Japan, May 20, 1969, 44/40064; 44/40065; 44/40066

Int. Cl. H03h *5/12*

U.S. Cl. 334—15 4 Claims

A tuning system for selecting, for instance, stations or broadcasting television channels, wherein the tuning can be

made totally electronically by impressing the output of a digitally controlled voltage generator upon variable capacitance coupled elements and the component parts are



reduced in number to facilitate integration of the circuit of the system.

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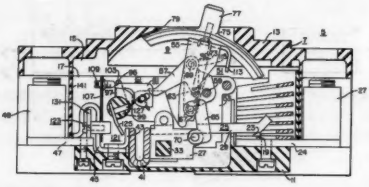
3,652,961

**CIRCUIT BREAKER WITH ELECTROMAGNETIC TRIP MEANS**

John G. Salvati, Beaver Falls, and Eugene J. Walker, Beaver, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 24, 1970, Ser. No. 75,200
Int. Cl. H01h *69/01*
U.S. Cl. 335—176 9 Claims



A circuit breaker with electromagnetic trip means comprises a stationary magnetic part and pole-piece means adjustably mounted on the stationary magnetic part to provide adjustment of the air gap between a stationary magnetic structure and a movable armature. The circuit breaker is a multi-pole circuit breaker with the armatures being mounted on a common trip bar.

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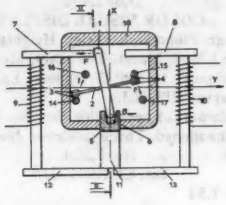
3,652,962

**SWITCHING DEVICE WITH MOVING PARTS IN THE FORM OF A CROSS**

Roger G. Preux, 27, rue d'Eaubonne, St. Gratien, France

Filed Sept. 23, 1970, Ser. No. 74,741
Claims priority, application France, Sept. 29, 1969, 6933124
Int. Cl. H01h *47/12*
U.S. Cl. 335—203 6 Claims

An electromagnetic switching device having a built-in unit consisting of a cross-shaped magnetic circuit element adapted to selectively cooperate with the poles of at least two magnetic circuits and having at least one contact element which may be driven by the magnetic circuit element towards



one of two positions so as to selectively close at least two corresponding electrical circuits.

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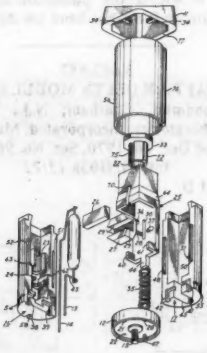
3,652,963

**PUSH BUTTON SWITCH**

Dean H. Fox, Golden, Colo., assignor to Hathaway Instruments, Inc., Denver, Colo.

Filed Nov. 19, 1970, Ser. No. 91,060
Int. Cl. H01h *3/12, 13/52*
U.S. Cl. 335—205 8 Claims



A push button switch of the magnetic reed type is provided with a rotatable actuating magnet to close the reed contacts in one position of the magnet and to open them in another. The magnet is rotatably mounted on the switch housing adjacent the reed switch on a stationary axis transverse to the longitudinal axis of the switch and is rotated from one position to the other by a linearly movable spring biased low inertia slide connected to rotate the magnet by operation of a crank pin and lost motion slot connection. The switch housing is a longitudinally split cylinder, provides a bore for the slide and is held in assembled relationship by a cylindrical sleeve and a closure cap.

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3,652,964

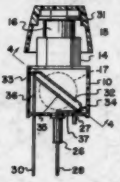
**PUSHBUTTON SWITCH AND ASSEMBLY**

Harold B. Chamberlain, Denver, Colo., assignor to Hathaway Instruments, Inc., Denver, Colo.

Filed Jan. 15, 1971, Ser. No. 106,786
Int. Cl. H01h *13/00, 13/14*
U.S. Cl. 335—205 7 Claims

A push button switch having a spring biased slidably movable actuator is provided with a magnetically actuated reed switch of the sealed enclosure type. A permanent magnet is mounted in a cylindrical block rotatably mounted about its

periphery in a cylindrical bearing in a fixed block adjacent the actuating slide. The magnet is rotated by a pin on the cylindrical block seated in a lateral slot in the slide. The switch is of a modular design and a plurality of the switches



may be physically interlocked and mounted to constitute a keyboard assembly. The switch housings can accommodate integrated circuit components to incorporate features of a full circuit assembly.

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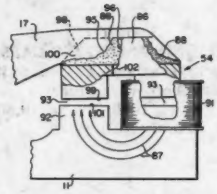
**3,652,965**

**RESILIENT MAGNETIC COUPLING**

**Frederick G. Krebs, Dayton, Ohio, and Samuel A. Redman, Garden City, N.Y., assignors to The National Cash Register Company, Dayton, Ohio**

**Filed Oct. 6, 1969, Ser. No. 863,812**
**Int. Cl. H01f 1/00**
**U.S. Cl. 335—277** **22 Claims**



An elastic coupling made from moldable curable material having both magnetic permeability and desirable mechanical properties, including resilience, flexure tolerance, and large-area contact with metallic members, is disclosed. Application of the coupling in a bonded junction between lightweight fast-acting fatigue-stress-susceptible members which are connected between acceleratable masses in a magnetic-solenoid-excited data-processing peripheral is shown.

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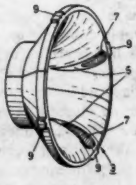
**3,652,966**

**DEFLECTION YOKE HAVING COIL LOCATING PROJECTIONS**

**Nicolass Frederik Meier, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed June 11, 1970, Ser. No. 45,325**
**Claims priority, application Netherlands, June 19, 1969, 6909344**
**Int. Cl. H01f 7/00**
**U.S. Cl. 335—210** **3 Claims**



Deflection coil unit having at least one pair of saddle-type coils surrounded by the flaring inner surface of a ferromagnetic yoke ring provided with ridge-shaped internal projections ground to fit the flaring outer surface of the pair of saddle coils.

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**3,652,967**

**SUPERCONDUCTIVE MAGNET**

**Eihachiro Tanaka; Yutaka Onodera, both of Sendai; Takeji Fukuda, Kanuma; Tsutomu Yamashita, Sendai, and Shoji Kuma, Hitachi, all of Japan, assignors to The Research Institute for Iron, Steel and Other Metals of the Tohoku University, Sendai, Japan**

**Filed Feb. 12, 1970, Ser. No. 10,971**
**Claims priority, application Japan, June 9, 1969, 44/44615**
**Int. Cl. H01f 7/22**
**U.S. Cl. 335—216** **3 Claims**

A superconductive magnet comprises superconductive coiled layers; diffusion shielding coiled layers, between which the superconductive coiled layer is put; stabilizing conductor coiled layers, between which the diffusion shielding coiled layer is put; and a normal conductor acting as a superconductive insulation between the superconductive coiled layers. Said superconductive magnet is produced by laminating thin sheets of metal or alloy to constitute the superconductive material in such a ratio that a superconductive alloy or intermetallic compound is formed, superposing thin sheets of metal or alloy shielding diffusion against the former thin sheets and thin sheets of metal or alloy stabilizing the superconductivity on both the surfaces of the laminated sheets respectively, coiling the formed sheets on a core sheath in multilayer, covering the resulting coiled body with an outer sheath, subjecting the assembly to a diameter reducing treatment to adhere the layers and heating the adhered layers until the superconductive alloy or intermetallic compound is formed.

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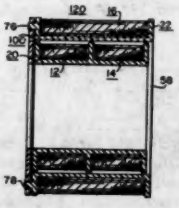
**3,652,968**

**TELESCOPED ELECTRICAL WINDINGS AND METHOD OF MAKING SAME**

**Ralph W. Johnston, Sharon; Donald S. Stephens, Sharpsville; Robert W. Miller, Grove City; Clarence W. Hunt, Transfer, and Frank J. Klecic, Sharon, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Jan. 26, 1971, Ser. No. 109,801**
**Int. Cl. H01f 27/30**
**U.S. Cl. 336—170** **13 Claims**



An electrical winding structure having first and second concentrically disposed, radially adjacent bobbins, each hav-

ing at least one electrical coil wound thereon. The outer bobbin provides layer insulation between the coils disposed on the bobbins. A method of constructing the winding is disclosed which includes the steps of winding coils on first and second bobbins, telescoping the first bobbin into an opening in the second bobbin, against a stop, and securing a retainer cap to an end of the second bobbin, to retain the first bobbin in assembled relation with the second bobbin, between the retainer cap and stop.

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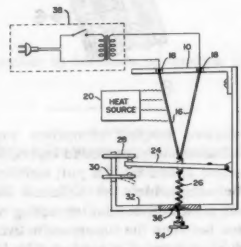
**3,652,969**

## METHOD AND APPARATUS FOR STABILIZING AND EMPLOYING TEMPERATURE SENSITIVE MATERIALS EXHIBITING MARTENSITIC TRANSITIONS

**James R. Willson, Garden Grove, and Donald W. Carey, Anaheim, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.**

**Filed May 27, 1969, Ser. No. 828,243**
**Int. Cl. C21d ; H01h** *37/50, 71/18*
**U.S. Cl. 337—140** **10 Claims**




A method and apparatus for stabilizing and employing temperature sensitive material exhibiting martensitic transitions for use in control and work performing devices. The method includes subjecting the martensitic-transition material to a greater unit stress than the material would be required to work against in its application to thereby stretch the material beyond its expected deflection, and subsequently completing a number of temperature cycles while the material is in such overstressed condition, through which it is heated to a point above its transition temperature and cooled back to its annealed temperature. After treatment the material operates through complete work cycles with no loss of dimension stability. In one embodiment, the apparatus defines a temperature sensitive switch including a load to apply an increased stress to the material during the initial stabilization temperature-cycling period and a reduced workload stress during periods of in-service operation.

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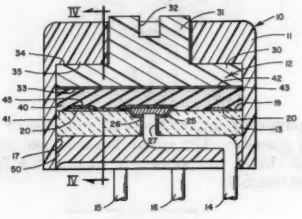
**3,652,970**

## VARIABLE RESISTOR HAVING AN IMPROVED WIPER MEMBER

**Gustav Hubert, San Gabriel, Calif., assignor to Spectrol Electronics Corporation, City of Industry, Calif.**

**Filed Feb. 25, 1971, Ser. No. 118,750**
**Int. Cl. H01c** *1/12*
**U.S. Cl. 338—174** **7 Claims**

A variable resistor of the rotary type is illustrated having a rotatable wiper member, a substrate member carrying an arcuate resistance element and a collector element, all coaxially secured in a cylindrical housing. The wiper member comprises a relatively rigid carriage element having a screw driver slot therein for rotating the wiper member from the exterior of the housing. A resilient pad element is adhesively secured to the carriage element. A flexible contact element is secured to the face of the pad element facing the resistance and collector elements so that the contact element makes electrical contact between the collector and the desired location on the resistance element. The spacing between the substrate member and the carriage member within the housing is less than the uncompressed thickness of the pad element so that the pad urges the contact element into firm engagement with the resistance and collector elements. The resistor may




be designed so that the pad element physically wipes the resistance element to keep it relatively clean and free of foreign material. Preferably, the variable resistor is designed so that a portion of the pad element forms a seal with the substrate member to prevent the passage of contaminates to the resistance element.

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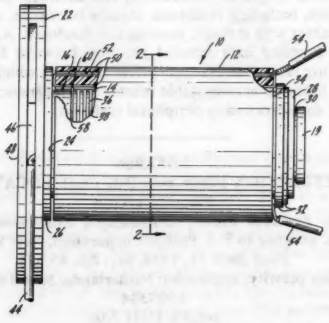
**3,652,971**

## SELF-ALIGNING SLIP RING CAPSULE

**Kenly C. Bugg, Fort Wayne, Ind., assignor to Kendick Manufacturing Company, Fort Wayne, Ind.**

**Filed Feb. 11, 1970, Ser. No. 10,500**
**Int. Cl. H01r** *39/40*
**U.S. Cl. 339—8** **20 Claims**



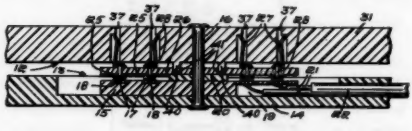

A self-aligning rotary electrical contact assembly for concentric relatively rotatable members having an annular recess in the first member, a linear recess in the second member, the linear recess being transverse to the annular recess, a first electrical conductor disposed within the annular recess forming an arcuate conducting element, a second electrical conductor linearly disposed within the linear recess, and a brush member disposed in the annular recess having a portion thereof projecting into the linear recess wherein the brush member is in rotatable contact with the arcuate conducting element and is in slidable contact with the second electrical conductor, thereby causing the brush member to be automatically positioned.

3,652,972

## TURNTABLE DEVICE

James W. Kreider, 18 Russell Road, Newton, Mass.

Filed Jan. 25, 1971, Ser. No. 109,592
Int. Cl. H01r 39/10
U.S. Cl. 339—8 PB 8 Claims



A turntable device for supporting a plurality of household appliances and including electrical plug receptacles maintained in a continuous state of energization during rotational movement of the device.

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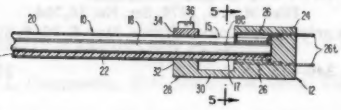
3,652,973

## MULTICONDUCTOR BELT AND CONNECTOR

Frederic C. Doughty, Valley Forge, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 21, 1970, Ser. No. 100,174
Int. Cl. H05k 1/00
U.S. Cl. 339—17 F 4 Claims



An electrical cable and a receptacle connector into which the cable is plugged. The cable is in the form of a belt, with the insulation on both sides readily removable for access to the conductor contact surfaces. The connector is provided with a releasable clamping means for securing the belt in the connector.

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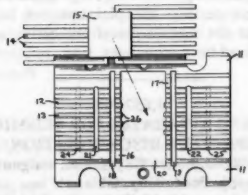
3,652,974

## INTEGRATED CIRCUIT CARRIER

Adam Tems, Philadelphia, Pa., assignor to Milross Controls, Inc., Southampton, Pa.

Filed Feb. 10, 1970, Ser. No. 9,683
Int. Cl. H01r 13/44, 13/52; H05k 1/02
U.S. Cl. 339—36 33 Claims



A one-piece electronic or electrical component module carrier having two parallel widthwise extending beams of resilient material formed integrally with a base member and spaced apart a distance slightly greater than the length of the component module to form a central opening with beam carried retaining elements which overlie the component module once it has been located within the central opening and which prevent the component module from falling or being vibrated out of the central opening. The beams are spread for insertion of the component module therebetween, and as the beams resiliently return to their normal positions, the component module is held by the overlying retaining elements. The base member has a plurality of channels formed lengthwise therein to accommodate the leads of the component module and lead access apertures are provided at any desired location in the carrier body. Additionally, support shelves are provided or the beams carry shelf members to support the component module on its lower surface and thereby eliminate all bending stresses on the leads where they emerge from the body of the module. The underlying support shelves and overlying retainers capture the component module and hold it securely but in a generally unstressed state.

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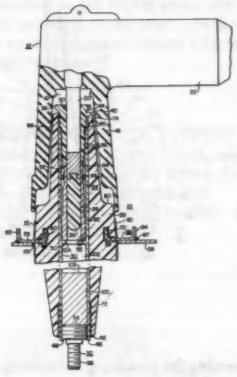
3,652,975

## ELECTRICAL CONNECTOR ASSEMBLY

August I. Keto, Sharpsville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 9, 1970, Ser. No. 1,827
Int. Cl. H01r 13/52
U.S. Cl. 339—111 11 Claims



A load break electrical connector assembly, including a bushing and a plug-in cable connector or termination. The bushing and plug-in cable connector include cooperative sleeve and rod members, respectively, formed of arc confining and extinguishing electrical insulating materials, with at least one of the cooperative insulating members being composed essentially of methyl methacrylate polymer, having a glass filter filler.

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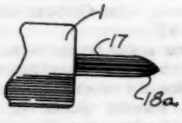
3,652,976

## THERMOCOUPLE CONNECTOR CONSTRUCTION

John Tymkewicz, c/o Marlin Mfg. Corp. 12404 Triskett Road, Fairview Park, Ohio

Filed Dec. 21, 1970, Ser. No. 99,767
Int. Cl. H01r 13/64, 11/22
U.S. Cl. 339—184 R 5 Claims




The disclosure hereof is that of thermocouple connector construction, wherein it is desired to maintain the differentia-

tion between positive and negative contacts, which are included in the usual pair of connector members, designated male and female, so that it will be impossible to reverse the contacts and thus connection of positive and negative contacts improperly made, and in addition to effectuate a much more complete area of contact between the respective contact members so that accurate readings in thermocouple meters will be provided since the area of contact is maintained to a much greater extent than would otherwise be the case by reason of the fact that uniform pressure is exerted upon such contacts substantially over the length thereof.

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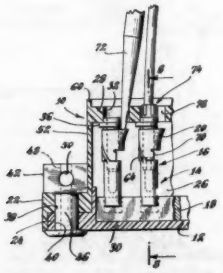
**3,652,977**

## ELECTRICAL JUNCTION ASSEMBLY

**Leonard H. Feldberg, Spring Valley, N.Y., assignor to Burndy Corporation**

**Filed May 28, 1970, Ser. No. 41,288**
**Int. Cl. H01r 11/22**
**U.S. Cl. 339—198 R** **5 Claims**



An assembly for providing a common electrical connection between a number of separate external conductors. A plurality of electrically coupled socket contacts are mounted within a two-part insulating housing. Each socket contact is provided with an encircling spring element, having a detent extending into the exterior of the socket and a radially projecting spout portion on the exterior. The detent locks the socket to an inserted pin contact attached to an external conductor, and the spout receives a lever tool which deflects the spring element so as to disengage the detent. Contact openings and access openings in the housing are aligned respectfully with the sockets and the spout portions.

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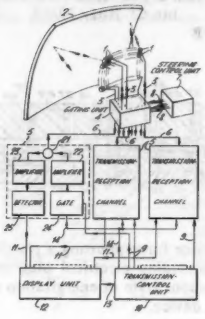
**3,652,978**

## ECHO-RESPONSIVE APPARATUS

**William Halliday, London, and Roy William George Haslett, Ilford, both of England, assignors to Smiths Industries Limited, London, England**

**Filed Dec. 19, 1969, Ser. No. 886,664**
**Claims priority, application Great Britain, Dec. 20, 1968, 60,652/68**
**Int. Cl. G01s 9/68**
**U.S. Cl. 340—3 R** **7 Claims**

A ship-borne sonar system includes a two-dimensional array of electromechanical transducers mounted on, or near, the focal surface of a concave spherical reflector to transmit and receive acoustic pulses in respective directions throughout a sideways sector of surveillance from the ship. A gating unit couples only some of the transducers to respective transmission-reception channels, the particular combination of transducers selected being controlled by a steering unit to stabilize or otherwise steer the transmission-reception direction within the surveillance-sector. Each detected echo



is displayed with a directionality dependent upon which of the channels detected that echo.

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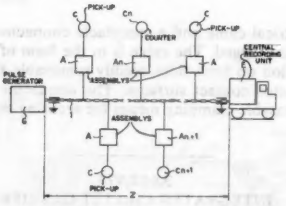
**3,652,979**

## INSTALLATION FOR THE TRANSMISSION OF MULTIPLEXED SEISMIC SIGNALS

**Philippe Angelle, Thouare, France, assignor to Compagnie Generale De Geophysique, Paris, France**

**Filed Mar. 5, 1970, Ser. No. 16,704**
**Claims priority, application France, Mar. 5, 1969, 6906077**
**Int. Cl. G01v 1/34**
**U.S. Cl. 340—15.5 MC** **10 Claims**



The electrical signals from different seismological pick-ups are recorded at a central recording unit by switching the units in succession to a single two wire transmission line. Switching is controlled by pulses transmitted on the line and by coding the pulses appropriately, e.g., pulse number coding or puise pattern coding, the pick-ups can be switched at times such that the signals therefrom arrive at the central unit in any desired time sequence.

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**3,652,980**

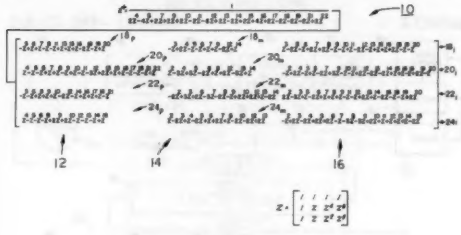
## METHOD AND APPARATUS FOR SEISMIC SIGNAL PATTERN DISCRIMINATION

**Pierre L. Goupillaud, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.**

**Filed Aug. 11, 1969, Ser. No. 848,777**
**Int. Cl. G01v 1/16, 1/28**
**U.S. Cl. 340—15.5** **10 Claims**

A method for extracting predetermined types of seismic data from an overall composite of seismic information, the method consisting of constructing an ideal filter for each of selected primary, multiple and/or interference components of a seismic tract group, such filter construction being carried out by determining the pseudoinverse or generalized inverse of a polynomial matrix as determined for the particular

seismic traces to be examined, with application of the polynomial matrix for preadjustment of a multichannel pattern discriminating filter which, when energized by the input seismic traces under examination, will produce separately the requisite primary, multiple and interference outputs which represent the respective components present. Apparatus for carrying out the method may consist of plural channels of




time domain filters connected in series with a weighting device for convolving respective plural seismic traces; each of the convolution filters is adjusted to function at predetermined times and amplitudes in accordance with the matrix function or operator determined for primary, multiple and interference trace functions of a particular group of seismic traces.

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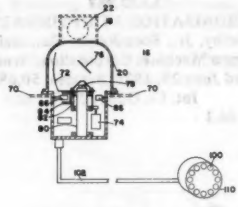
**3,652,981**

## PROXIMITY WARNING AND COLLISION AVOIDANCE SYSTEMS

**Angelo J. Campanella, 3201 Ridgewood Drive, Columbus, Ohio**

**Filed Apr. 13, 1970, Ser. No. 28,353**
**Int. Cl. G01j 1/28**
**U.S. Cl. 340—25** **7 Claims**



This is an inflight aircraft warning system of advising a pilot of relative danger of collision with another aircraft. Sensor and display means are provided for indicating the presence, direction, and the rate of closeness of an approaching aircraft.

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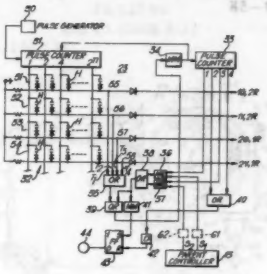
**3,652,982**

## TRAFFIC SIGNAL CONTROL SYSTEM FOR ADJACENT INTERSECTIONS

**Hideto Todaka, and Hisao Nakatani, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan**

**Filed Jan. 5, 1970, Ser. No. 628**
**Claims priority, application Japan, Feb. 16, 1969, 44/3083**
**Int. Cl. G08g 1/085**
**U.S. Cl. 340—35** **4 Claims**

A traffic signal control system which includes a parent controller for controlling the traffic signal at a first street intersection and at least one associated controller for controlling the traffic signal at a second street intersection adjacent to the first intersection in a manner associated with the signal control by the parent controller. Normally, the associated controller operates keeping its association with the parent controller. When the association has been broken for one cause or another, the associated controller controls the traffic signal in accordance with a predetermined control pat-



tern of its own independently of the parent controller so as not to cause any confusion to the traffic about the intersections. Means may be provided to indicate whether the associated controller is operating in association with the parent controller or independently thereof.

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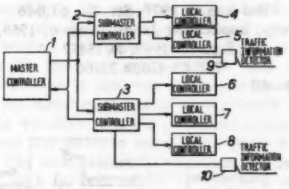
**3,652,983**

## TRAFFIC SIGNAL CONTROL SYSTEM

**Tadao Endo, and Mituhisa Hosika, Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Ukyo-ku, Kyoto, Japan**

**Filed Feb. 11, 1970, Ser. No. 10,403**
**Claims priority, application Japan, Feb. 21, 1969, 44/13442; Mar. 8, 1969, 44/17685**
**Int. Cl. G08g 1/00**
**U.S. Cl. 340—40** **4 Claims**



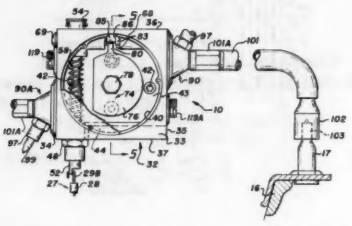

A system for controlling the traffic signals within a relatively wide district divided into a plurality of subdistricts, in each of which there are distributed many traffic signals at different places. A submaster controller coordinately controls many local controllers within each subdistrict, and a master controller controls all the submaster controllers within the wide district. The master controller gives the same cycle pulses and the same series of synchronizing pulses, but different offsets, to different submaster controllers, and each submaster controller provides a second series of synchronizing pulses, which are displaced in time from the first series of synchronizing pulses by the offset time given to the submaster controller, to the local controllers belonging to the submaster controller, so that the local controllers control their respective traffic signals on the basis of the synchronizing pulses received from the submaster controller. Thus, with proper different offsets given to the different submaster controllers, all the traffic signals in the wide district are coordinately controlled in accordance with the actual traffic conditions in the different subdistricts for establishment of smooth traffic flows throughout the wide district.

3,652,984

## PRESSURE SIGNALLING APPARATUS FOR TIRES

Leslie H. Jordan, 2021 East Broadway, Vancouver, British Columbia, and John Arden, 6049 Portland Avenue, Burnaby, British Columbia, both of Canada

Filed Jan. 15, 1970, Ser. No. 3,076
Int. Cl. G08b 21/00
U.S. Cl. 340—58 3 Claims



Apparatus having a bolt movable from a normally retracted position to a released signal operating position. A latch normally holds the bolt in the retracted position and a trigger arrangement controls the latch. An air gauging device, associated with a valve through which a tire is charged to a selected air pressure, is coupled to the trigger to operate same thereby actuating the latch and releasing the bolt when air pressure in the tire falls a predetermined amount below the selected level.

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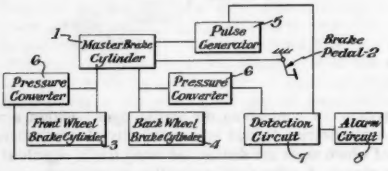
3,652,985

## ALARM SYSTEM FOR VEHICLE HYDRAULIC PRESSURE CIRCUIT

Toru Toshioka, and Toshinobu Kuroyama, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota , Aichi, Japan

Filed Aug. 5, 1970, Ser. No. 61,046
Claims priority, application Japan, Aug. 6, 1969, 44/61943; Sept. 23, 1969, 44/75457
Int. Cl. G08b 21/00
U.S. Cl. 340—60 4 Claims



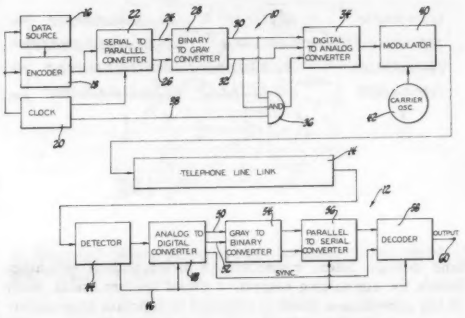

Alarm system for hydraulic pressure circuit provides warning regarding functional deterioration or failure in hydraulic pressure circuit such as oil pressure circuit of hydraulic brake system of vehicle. System comprises pulse generator for periodically obtaining hydraulic pressure pulses representative of pressure in hydraulic pressure circuit. Pressure converter located in hydraulic pressure circuit changes hydraulic pressure pulses into electric pulses, and detecting circuit detects difference between waveform of electric pulses obtained by pressure converter and waveform of electric pulses representative of pressure in hydraulic pressure circuit when circuit is normal. Alarm device connected to detecting circuit is energized when waveform of electric pulses from pressure converter differs from waveform of electric pulses representative of pressure in hydraulic pressure circuit when circuit is normal.

3,652,986

## ERROR CONTROL TRANSCEIVER

Kenneth E. Monroe, Ann Arbor, Mich., assignor to Datamax Corporation, Ann Arbor, Mich.

Filed Feb. 9, 1970, Ser. No. 9,585
Int. Cl. H04b 3/46
U.S. Cl. 340—146.1 R 8 Claims




An asynchronous data communication system wherein the transmitted signal represents two bit types, it being necessary to segregate the bit types at the receiver. To accomplish the segregation in the proper phase, a selected randomly occurring bit group is combined with a sync signal and converted to a special analog level which uniquely represents the simultaneous selected bit group and sync signal occurrence. The receiver decodes the special analog level back into the bit group and the sync signal and ensures that the bit type segregating unit is in the phase determined to be proper by the original bit type organization established in the transmitter.

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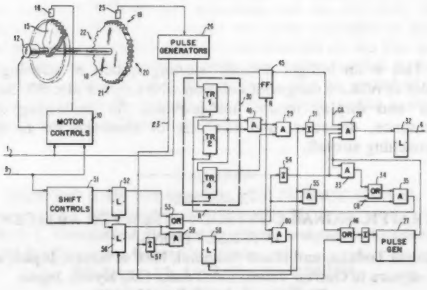
3,652,987

## SYNCHRONIZATION VERIFYING SYSTEM

Justin H. McCarthy, Jr., Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 29, 1970, Ser. No. 50,684
Int. Cl. G08c 25/00
U.S. Cl. 340—146.1 9 Claims

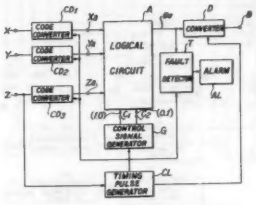



Emitter pulses generated in groups are checked to determine whether or not the correct number are present in each group. The pulses are introduced to a counter, the contents of which is inspected by appropriately timed gating whenever a count equivalent to a full pulse group should be present. The inspection circuitry is controlled so as to accommodate acceptable odd spacing in the pulse groups.

## 3,652,988
## LOGICAL SYSTEM DETECTABLE OF FAULT OF ANY LOGICAL ELEMENT THEREIN

Hideo Yamamoto, Sagamihara, and Teruji Watanabe, Niza-Machi, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo-to, Japan

Filed July 14, 1970, Ser. No. 54,685
Claims priority, application Japan, July 16, 1969, 44/55740
Int. Cl. G08c 25/00
U.S. Cl. 340—146.1AB 4 Claims

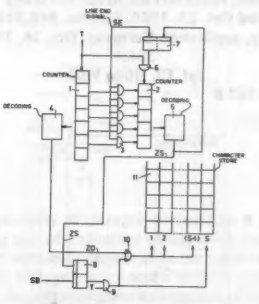



A logical system provided with a logical circuit using at least one logical element, in which the logical element performs a first logical function in response to a first control binary information and a second logical function in response to a second control binary information. Input pair signals (1,0) and (0,1) which are successive binary signal elements different from each other are applied to the logical circuit as input signals while control binary information is applied to the logical element so as to alternately perform the first logical function and the second logical function. Faults of the logical element can be detected by detecting at the output of the logical circuit a fault pair signal (1,1) or (0,0) which are successive signal elements of the same binary information.

## 3,652,989
## SENSING ARRANGEMENT FOR USE WITH APPARATUS FOR AUTOMATIC CHARACTER RECOGNITION

Dieter Poddig, Hamburg, and Hans Hoffmann, Friedrichsgabe Post Harksheide, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 13, 1968, Ser. No. 775,392
Int. Cl. G06k 9/12
U.S. Cl. 340—146.3 H 3 Claims

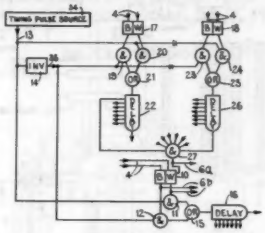



A character recognition device for use with printed characters and designed to indicate the character at a plurality of interrogation positions. A storage device is included which will store information relating to a plurality of position digitized signals of a single vertical line element. The information of the vertical line element is modified within the storage device so as to provide an indication of the center of the vertical line element in accordance with one of the interrogation positions.

## 3,652,990
## APPARATUS FOR THE RECOGNITION OR ANALYSIS OF PATTERNS

George Pember Darwin, London, England, assignor to International Computers Limited, London, England

Filed Feb. 17, 1970, Ser. No. 12,066
Claims priority, application Great Britain, Feb. 25, 1969, 10,025/69
Int. Cl. G06k 9/12
U.S. Cl. 340—146.3AC 9 Claims




Data processing apparatus for the recognition or analysis of patterns, which may, for example, be character representations requires that the pattern to be processed be divided into elementary areas arranged in a matrix. The matrix of areas is scanned by a corresponding matrix of detecting elements, such as photocells, and the resultant signals are applied as inputs to a plurality of logic units. Each logic unit is, for example, primarily associated with a specific elementary area of the pattern but connections are also provided to the unit from those detecting elements scanning other pattern areas having a particular positional relationship to the primarily associated one. These other pattern areas are typically those immediately surrounding the primarily associated one. A standard timing waveform is applied to the logic units and is modified according to the states of and positional relationships of the pattern areas whose detectors are connected to the logic unit, so that the output of the logic unit has a time relationship to the standard timing waveform which is dependent on these positions and states. For example, the areas with which a logic unit is associated may produce varying delays to the standard waveform and the various waveforms derived in this way may again be recombined. Typically, the states of the areas may produce a half-cycle delay in the waveform and the positional differences of the various areas may produce appropriate phase delays in the waveform. The resultant output waveform may be that made to indicate such features of the pattern as it is desired to recognize, such as, for example, the direction of a line, or the existence of a curve or junction in the line.

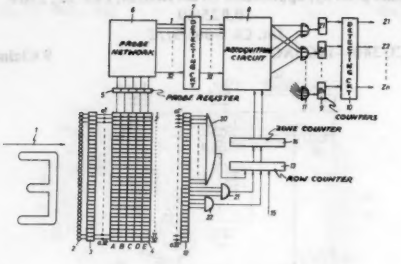
## 3,652,991
## ARRANGEMENT FOR CHARACTER RECOGNITION OF CHARACTERS WHICH ARE BROKEN UP INTO CHARACTERISTIC SHAPE ELEMENTS

Walter Dietrich, Pforzheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 17, 1970, Ser. No. 64,217
Claims priority, application Germany, Aug. 29, 1969, P 19 44 073.4
Int. Cl. G06k 9/13
U.S. Cl. 340—146.3 J 15 Claims

The present invention relates to automatic character recognition, in which the characters are broken up into their characteristic shape elements, and in which the scanned and electrically stored shape elements are detected by probes corresponding to the shape elements. The shape elements are successively fed to the probes, and the probe most similar to the particular shape element, is detected by a first extreme value detecting circuit. The detected probe is assigned to the relevant character on the basis of its location in the character

area, and the number of probes for each character is stored, so that the character with the largest number of assigned




shape elements is determined and recognized by a second extreme value detecting circuit.

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**3,652,992**

**METHOD AND APPARATUS FOR QUANTIZING A CHARACTER OR TEST PATTERN PREFERABLY FOR THE PURPOSE OF GAINING CONTROL DATA FOR ELECTRONIC PHOTO COMPOSITION**

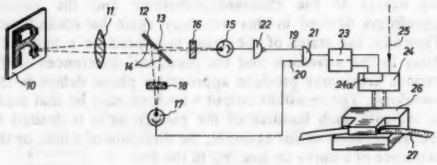
**Roman Koll, Kiel-Wellingdorf, Germany, assignor to Dr.-Ing. Rudolf Hell**

**Filed Oct. 20, 1969, Ser. No. 867,580**

**Claims priority, application Germany, Nov. 2, 1968, P 18 06 559.3**

**Int. Cl. G06k 9/00**

**U.S. Cl. 340—146.3 B** **11 Claims**



The edges of a test pattern which lie along the direction of scanning are provided with companion tapes of a contrasting color which causes the generation of a signal during scanning to prevent undesired operation of recording equipment in response to undesired alterations of dark and light data due to distortion of the character or misalignment of the character with respect to the scanning direction. The sensing apparatus employs means for point-by-point and area-by-area outer-field sensing of data from the character and means for permitting storage of the data so sensed in accordance with an outer-field scan of areas immediately adjacent the scanned points. The sensing apparatus includes an apertured diaphragm for direction the information of the point-by-point or sharp scanning to a registration control circuit and the information derived from outer-field scanning to the registration control circuit for preventing the registration of information detected due to flaws or inadvertent irregularity of character contours.

**3,652,993**

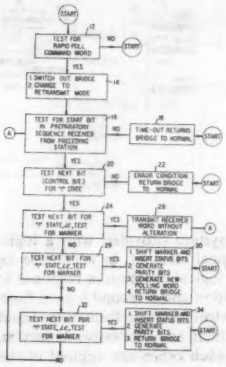
**RAPID POLLING METHOD FOR DIGITAL COMMUNICATIONS NETWORK**

**John Dewey Bridwell, Little Silver, and Donald van Zelm Wadsworth, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.**

**Filed July 24, 1970, Ser. No. 58,002**

**Int. Cl. H04q 9/00; H04j 3/00**

**U.S. Cl. 340—147 R** **10 Claims**



All of the remote stations to be rapidly polled are connected in a series loop with the control station, which transmits a rapid polling word containing several information bits followed by a marker bit. Each remote station, while retransmitting the word to the following station in the loop, advances the marker one or more bit positions and inserts its own status information in those positions. The remote stations recognize a full word by the position of the marker and ignore it. The remote stations may also be programmed to alter error checking parity bits in accordance with the alterations made in the information bits.

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**3,652,994**

**SELECTIVE CONTROL SYSTEM FOR SLIDE PROJECTORS**

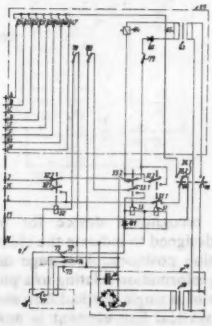
**Josef Scheibel, Ober-Morlen, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany**

**Filed Oct. 23, 1969, Ser. No. 868,816**

**Claims priority, application Germany, Oct. 26, 1968, P 18 05 384.4**

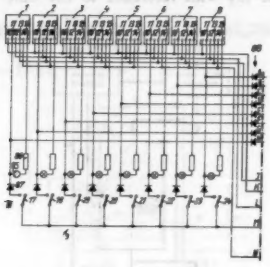
**Int. Cl. H04q 9/00**

**U.S. Cl. 340—147 R** **21 Claims**



A selector switch is furnished for each of a plurality of slide projectors. The switch may be closed either manually or

through a corresponding feeler operating in conjunction with a punched tape. This causes the selective slide projectors to be set for a slide change. A control signal then causes all



selected slide projectors to change slides simultaneously. A synchronizing system is furnished for synchronizing the transport of the tape to the end of the control signal for an automatically controlled slide show.

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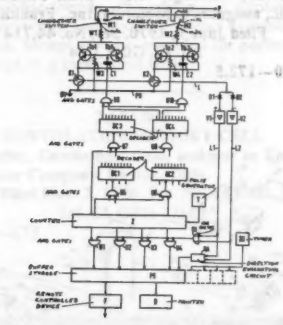
**3,652,995**

## INPUT CIRCUIT FOR A SIGNALLING SYSTEM WHICH CYCLICALLY SCANS A PLURALITY OF SIGNALLING STATIONS UNDER COUNTER CONTROL

**Hans-Ulrich Amberg, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany**

**Filed July 8, 1970, Ser. No. 53,227**
**Claims priority, application Germany, July 11, 1969, P 19 35 235.3**
**Int. Cl. H04q** *3/00, 9/00, 5/00*
**U.S. Cl. 340—167** **5 Claims**



Each of a plurality of changeover switches is provided at a corresponding one of a plurality of signalling stations and has a first contact terminal connected to the positive polarity terminal of a DC voltage source and a second contact terminal connected to the negative polarity terminal of the DC voltage source. Each of the plurality of transistor circuits is provided at a corresponding one of the signalling stations. Each transistor circuit comprises a PNP type transistor and an NPN type transistor connected in parallel with each other and connected to the fixed terminal of the switch arm of the corresponding one of the changeover switches. Each transistor circuit is electrically connected to a bus bar for applying a potential between the potentials of the terminals of the DC voltage source via the control winding of the corresponding one of the magnetic cores. Each transistor of each transistor circuit has a base electrode coupled to a counter via a decoder. The counter is controlled by a pulse generator.

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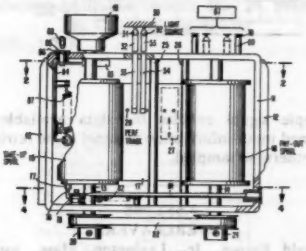
**3,652,996**

## INFORMATION RETRIEVING ARRANGEMENT

**Klaus Schlickeiser, Boll near Hechingen, Germany, assignor to Dipl. Ing. Walter Buhmann Elektro-Apparatebau GmbH, Hechingen, Hohenzollern, Germany**

**Filed Feb. 9, 1970, Ser. No. 9,783**
**Claims priority, application Germany, Feb. 7, 1969, P 19 06 136.0**
**Int. Cl. G11b** *7/00*
**U.S. Cl. 340—172.5** **12 Claims**



Tape units are provided each including a pair of spaced rotatable spools accommodated in a casing, a multiple-track magnetic tape trained about the spools for advancement in a predetermined path. A device for using these tape units is arranged to cooperate with them and includes a magnetic head displaceable transversely to the path of the magnetic tape, advancing means for advancing the tape in the path in incremental steps of identical length each corresponding to a bit of retrievable information on the tape, a plurality of optically detectable indicia on the tape successively spaced at intervals corresponding to the length of one of the steps, detecting means for optically detecting successive ones of the indicia in response to incremental stepwise advancement of the tape, and for producing a recognition signal, storage means actuatable in response to detection of successive ones of the indicia for storing the recognition signals, and retrieving means for selecting a recognition signal corresponding to a predetermined bit of information which it is desired to retrieve, and for cooperating with the storage means nd the advancing means in a sense advancing the tape until correspondence of the predetermined bit of information with the magnetic head.

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**3,652,997**

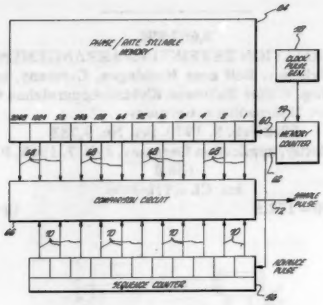
## CONTROL SYSTEM FOR MULTIPLE SIGNAL CHANNELS

**Ralph G. Cromleigh, P.O. Box 751, La Canada, Calif.**

**Filed Feb. 25, 1970, Ser. No. 13,927**
**Int. Cl. G06f** *5/06;* **H04l** *7/00*
**U.S. Cl. 340—172.5** **13 Claims**

A digital data processing system for controlling the sampling of data from, or the distribution of data to, a plurality of information channels is disclosed. The processing system includes a memory which serves to store a plurality of multibit binary syllables. Each of these multibit binary syllables includes a predetermined number of ones and zeros which define a sampling rate and a phase. The most significant bit appearing as a one defines the sampling rate, while all of the lesser significant bit positions, relative to the most significant bit appearing as a one, define the phase. A comparison circuit is employed to compare the contents of a digital counter, which is advanced at a predetermined rate, with each of the

multibit binary syllables. Each valid comparison results in the generation of a sample signal by the comparison circuit,




which sample signal enables the data available over a predetermined input information channel to be retrieved, extracted or otherwise sampled.

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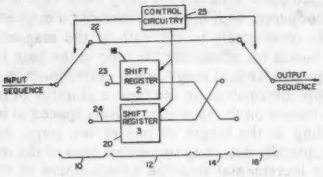
**3,652,998**

## INTERLEAVERS

**George David Forney, Jr., Lexington, Mass., assignor to Codex Corporation, Watertown, Mass.**

**Filed Mar., 1970, Ser. No. 17,417**
**Int. Cl. G06f *13/02*, *7/00***
**U.S. Cl. 340—172.5** **17 Claims**




Interleavers, which spread the bits in a group of length B in the input sequence so that any pair are at least N bits apart in the output sequence, in which delaying circuitry (e.g., one or more shift registers) cooperates with control circuitry to define a plurality of delay paths, each of which is of constant length, the number of such paths being equal to the period, P, of the interleaver (where 2 P<BN/2). The control circuitry classifies any P successive bits of the input sequence to the P different delay paths, the bits being classified to any such path being spaced P bits apart. The output sequence is derived by sequentially selecting bits from the various delay paths.

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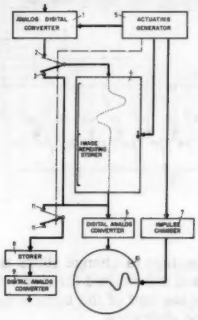
**3,652,999**

## DEVICE FOR VISUALIZING MEASURED QUANTITIES

**Bo Hjort, Sollentuna, and Kurt K. H. A. Berglund, Solna, both of Sweden, assignors to Siemens Aktiengesellschaft, Erlangen, Germany**

**Filed Apr. 13, 1970, Ser. No. 27,878**
**Int. Cl. G06f *3/14***
**U.S. Cl. 340—172.5** **10 Claims**

A device for making visible analogous time dependent measured quantities, for example, of an electrocardiogram by an electronic ray upon a screen, uses an analog digital converter to produce derived digital measured values. The device also uses at least one image repeating storer in which is stored a predetermined amount of measured quantities as individual digital measured values. These values are obtained from the storer in cycles and are delivered through a digital analog converter and a time deflecting device synchronized with the storer. The deflecting device periodically deflects the electronic ray with reference to the time axis of the




screen. The present invention is particularly characterized in that the individual digitally stored measured values after conversion are transmitted as deviating voltage perpendicularly to the time axis upon a cathode ray oscillograph inscribing with brightness which remains uniform. The inscribing ray is key-darkened during its guided return to the initial position by the time deflecting device.

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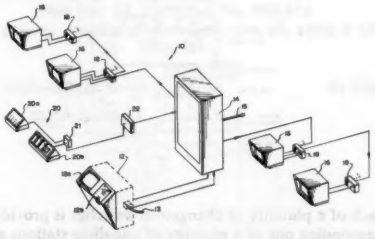
**3,653,000**

## DATA STORAGE AND DISPLAY SYSTEM

**Kenneth Kielar, Norridge, and William Milleker, Chicago, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.**

**Filed June 9, 1970, Ser. No. 44,714**
**Int. Cl. G06f *3/14***
**U.S. Cl. 340—172.5** **18 Claims**

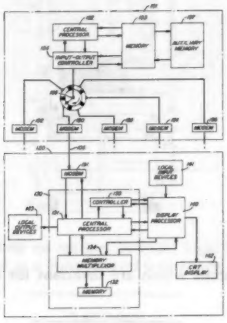


A data storage and display system utilizing a memory register for receiving names of personnel in response to coded cards having indicia corresponding to alphanumeric characters and storing the information indicative of each alphanumeric character and displaying the same on a display screen in alphabetical order to indicate to other personnel the names of those registered. A permanent memory in combination with a memory register and shift register operate cyclically to insert new names in the memory in alphabetical order automatically upon insertion of a particular coded card into a card reader.

## 3,653,001
## TIME-SHARED COMPUTER GRAPHICS SYSTEM HAVING DATA PROCESSING MEANS AT DISPLAY TERMINALS

William H. Ninke, Millington, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 13, 1967, Ser. No. 682,280
Int. Cl. G06f 3/14
U.S. Cl. 340—172.5 23 Claims

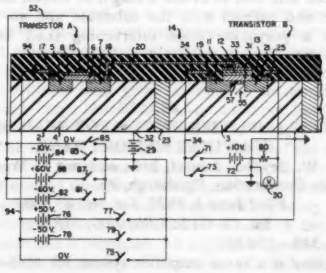


An interactive computer-driven CRT display system is described. This system features at least one local console for interacting with a large time-shared central computer. Each console includes a small general purpose computer, special purpose display hardware and software, and several input means, including a light pen. The special purpose hardware includes a display processor for performing many processing steps independently of the small computer. Means are also provided for detecting violations of the boundaries of a display device and for controlling signals applied to the display device in response thereto. Processing and display functions proceed concurrently and share computer capabilities on an interrupt basis. Means are also provided for performing data transformations on a cumulative basis.

## 3,653,002
## NONVOLATILE MEMORY CELL

James A. Goffee, Cambridge, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Mar. 2, 1970, Ser. No. 15,632
Int. Cl. G11c 11/38
U.S. Cl. 340—173 4 Claims

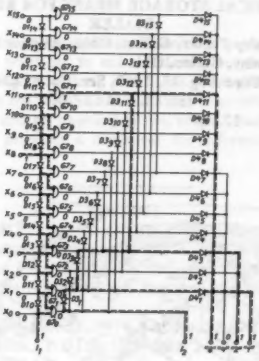


The present invention relates to a nonvolatile memory cell having an MOS control transistor electrically connected to the gate electrode of an MNOS memory transistor. The nonvolatile memory cell may be set by momentarily applying a set potential to the MNOS memory transistor using the MOS control transistor, to which a pass potential is applied. The nonvolatile memory cell may be reset by momentarily applying a reset potential to the MNOS memory transistor using the volatile MOS control transistor, to which a pass potential is applied.

## 3,653,003
## APPARATUS FOR IDENTIFYING THOSE MEANS OF A PLURALITY OF MEANS WHICH HAVE CHANGED STATE

Goran Anders Henrik Hemdal, Bollmoravagen, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed May 1, 1970, Ser. No. 33,642
Claims priority, application Sweden, May 29, 1969, 7573/69
Int. Cl. G11c 15/00, 9/00
U.S. Cl. 340—173 R 8 Claims



Apparatus for identifying those means of a plurality of means which have changed their binary state. A reference is sequentially obtained to only those means which have changed their state without spending unnecessary work sifting off the remaining means. The arrangement is particularly applicable in telecommunication systems, more especially such systems which have a central control, e.g., program store controlled systems in which the arrangement makes it possible to reduce considerably the idle load of a controlling computer.

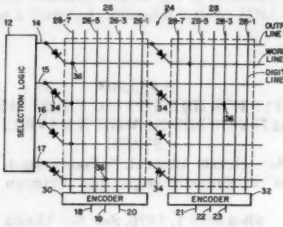
## 3,653,004
## READ-ONLY MEMORY ORGANIZATION

William F. Jordan, Jr., Wellesley, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 25, 1970, Ser. No. 40,019
Int. Cl. G11c 17/00
U.S. Cl. 340—173 SP 17 Claims

A read-only memory organization having a plurality of matrices, each of the matrices including digit lines and word lines orthogonal thereto. The word lines are coupled to the output lines of word selection means by coupling means such as diodes or transistors. Information is stored in the memory by selectively interconnecting the digit lines and the word lines in each of the matrices, the interconnections being a

maximum of one for each word line. The number of coupling means is equal to the number of word lines in each of the




matrices. An encoder is provided for each of the matrices to encode the information stored at the interconnections.

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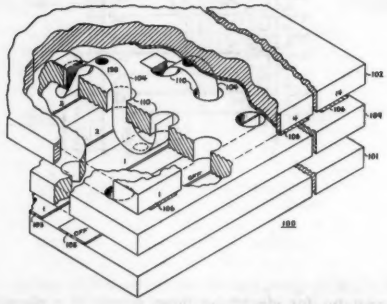
**3,653,005**

**MECHANICAL STORAGE MEANS FOR REPERTORY DIALER**

**Warren Wesley Porter, Galion, Ohio, assignor to North Electric Company, Galion, Ohio**

**Filed Aug. 25, 1969, Ser. No. 852,662**
**Int. Cl. G11c *17/00***
**U.S. Cl. 340—173 SP** **3 Claims**



Mechanical storage apparatus for a repertory dialer including a pair of conductor bearing boards with contacts selectively interconnecting the conductors on one board with the conductors on the other providing a preestablished set of paths for routing successive pulses representing the digits and digital values of a stored directory number to succeeding circuitry which generates corresponding digital signals for use in setting up a communication path.

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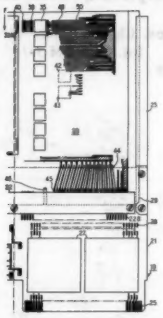
**3,653,006**

**ASSEMBLAGE ELEMENT FOR FUNCTIONAL UNIT**

**Bernard Claude Kohler, Paris; Gerard Philippe Manoussi, Creil, and Serge Auguste Touron, Bagnolet, all of France, assignors to Societe Industrielle Honeywell Bull, Paris, France**

**Filed Dec. 24, 1969, Ser. No. 887,940**
**Claims priority, application France, Dec. 27, 1968, 181105**
**Int. Cl. G11c *11/00***
**U.S. Cl. 340—173 SP** **12 Claims**

A read-only memory wherein a complete unit thereof is fabricated as a pluggable circuit board, the board being adapted to function with different storage components by supporting the storage components in a removable pluggable fashion, the board proper holding in fixed form those elements and circuits which are invariant for different storage components.



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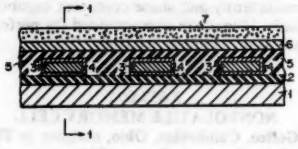
**3,653,007**

**FLAT TYPE MAGNETIC THIN FILM MEMORY**

**Yoshio Murakami, Yokohama; Iwao Higashinakagawa, Kawasaki; Nobuaki Yasuda, Zushi, and Motoharu Sato, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan**

**Filed Feb. 19, 1970, Ser. No. 12,781**
**Claims priority, application Japan, Feb. 19, 1969, 44/11764; May 14, 1969, 44/36686**
**Int. Cl. G11c *11/14***
**U.S. Cl. 340—174 TF** **9 Claims**



A flat type magnetic thin film memory comprising a metal substrate, at least one group of drive lines each provided with a magnetic thin film to define a magnetic circuit and extending over and parallel with the substrate and an insulation layer of a polyimide resin intervening (i.e., interposed) between the substrate and the drive line group.

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**3,653,008**

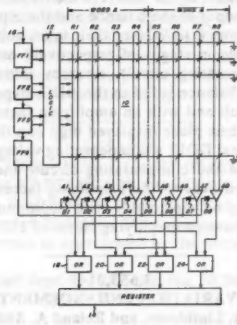
**SENSE AMPLIFIER SYSTEM FOR READ-ONLY COMPUTER MEMORY BANK**

**William W. Beydler, Laurel, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed June 4, 1970, Ser. No. 43,530**
**Int. Cl. G11c *7/06, 9/00, 11/00***
**U.S. Cl. 340—174 M** **6 Claims**

Described is a sense amplifier system for read-only computer memory banks having a bipolar output to distinguish "ones" and "zeros." The system is characterized in that each bit of a memory word consisting of several computer words can be read out with the use of only two integrated circuits, an operational amplifier and a gate. At the same time, the system provides for interfacing with various logic voltage

levels. This is accomplished by connecting a diode to the output of the operational amplifier for each bit for strobing purposes and by using an emitter coupled logic gate both as a gating device and as a voltage level translating device.



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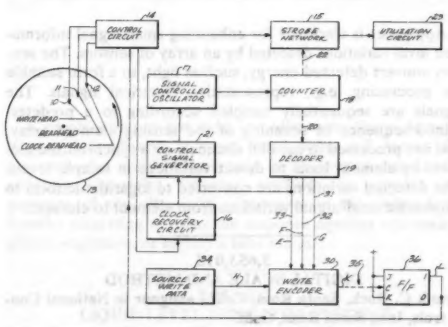
3,653,009

## CORRECTION OF ASYNCHRONOUS TIMING UTILIZING A PHASE CONTROL LOOP

Peter L. Krause, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 12, 1970, Ser. No. 80,092
Int. Cl. G11b 5/02, 5/44
U.S. Cl. 340—174.1 A 16 Claims



Binary data is stored on a moving magnetic medium as data transitions occurring at multiples of a nominal time interval and pairs of control transitions are recorded on the medium between successive data transitions whenever data transitions occur at some given multiple of the nominal time interval that is larger than one. The time interval between the pair of control transitions is substantially smaller than the nominal time interval. Variations in the speed of the medium during recording are sensed and the time of occurrence of the pair of control transitions is adjusted as the speed of the medium varies to maintain a predetermined spacing relative to the successive data transitions between which the pair of control transitions is recorded. An oscillator synchronized to a multiple of the frequency of occurrence of clock transitions on the medium and a counter responsive to the oscillator are employed both to retrieve and to store data. During retrieval, the states of the counter provide a group of successive strobe pulses, the sum of the durations of which remain equal to the period between clock transitions as the speed of the medium varies. During storage, the data and control transitions are recorded on the medium responsive to selected states of the counter to maintain the predetermined spacing between data and control transitions as the speed of the medium varies.

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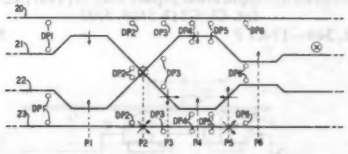
3,653,010

## MAGNETIC DOMAIN LOGIC ARRANGEMENT

John Alexander Copeland, III, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 12, 1970, Ser. No. 88,691
Int. Cl. G11c 21/00
U.S. Cl. 340—174 TF 10 Claims



A strip of magnetically soft material of proper geometry defines stable positions to either side thereof for single wall domains moving therealong in a sheet of magnetic material. An opening in the strip has been found to produce an inversion function and an opening in two strips where they intersect similarly provides a crossover for information moving along the rails.

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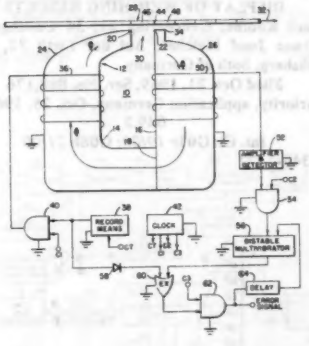
3,653,011

## THREE POLE TIP READ AFTER WRITE TRANSDUCER

James P. Donohue, Fairborn; Donald A. Bange, Dayton, both of Ohio, and John J. Miyata, Monterey Park, Calif., assignors to The National Cash Register Company, Dayton, Ohio

Filed Apr. 15, 1970, Ser. No. 28,873
Int. Cl. G11b 5/22, 5/46, 27/36
U.S. Cl. 340—174.1 B 10 Claims



A magnetic recording head is provided with a pair of pole tips separated by a high-reluctance gap, and the pole tips are coupled together by a low-reluctance path. The head is further provided with a third pole tip. A magnetic medium, such as a tape, is passed over the head in such a manner that any point on the medium passes over the gap and thereafter over the third pole tip. A pair of coils are wound around the low-reluctance coupling path, one of which is used to cause a magnetic field to exist in the gap and thereby be applied to the medium, and the other of which is used to detect any change in the direction of the magnetic field on the medium

as it passes in the vicinity of the third pole tip. Means are further provided to determine whether the signal provided by the detecting coil corresponds to an expected signal.

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**3,653,012**

## MAGNETIC HEAD WITH GAPS SPACED AS A FUNCTION OF THE DISTANCE BETWEEN RECORDED LINES OF INFORMATION

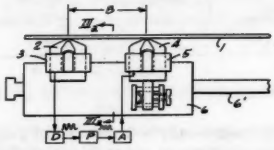
**Saburo Uemura, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Continuation of application Ser. No. 732,248, May 27, 1968, now abandoned. This application Oct. 2, 1970, Ser. No. 77,717**

**Claims priority, application Japan, May 31, 1967, 42/35111**

**Int. Cl. G11b** *5/86, 5/02*

**U.S. Cl. 340—174.1 P** **5 Claims**



An apparatus for the magnetic recording of gradient information wherein a magnetic gradient of given length is reproduced on a magnetic medium. A readout magnetic head is provided for sensing the recorded gradient information and a writing head is used to reproduce the gradient information onto an extended portion of a magnetic member containing the gradient information. Either the readout head or the writing head is provided with means for adjusting the distance between the two heads. The readout head and the writing head may be positioned opposed from one another so as to sense gradient information on a master copy of magnetic material and reproduce the gradient information on a magnetic member used for positioning machine tools or the like.

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**3,653,013**

## ARRANGEMENT FOR RESOLUTION AND DIGITAL DISPLAY OF WEIGHING RESULTS

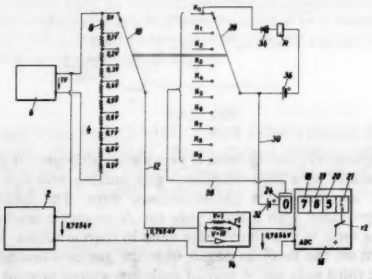
**Erich Emil Knothe, Gehrenring 21, 34 Gottingen-Geisnar, and Franz Josef Melcher, Auf der Lieth 32, Gottingen-Nikolausberg, both of Germany**

**Filed Oct. 21, 1969, Ser. No. 868,176**

**Claims priority, application Germany, Oct. 25, 1968, P 18 05 049.2**

**Int. Cl. G01r** *19/00;* **G08b** *21/00*

**U.S. Cl. 340—177** **14 Claims**



An arrangement on an electrical weighing balance for the digital display of weighing results. The balance has an output voltage analogous to the load. An analogue-digital converter having several digit display units is connected to the output of the balance. There is an additional digit display unit and a voltage compensating circuit and an amplifier with selectable amplifying factors of 10 and 1 which can be switched in between the output of the balance and the input of the ADC, and voltages from 0 to 9/10 of their input voltages are selectively adjustable in stages of respectively one-tenth on the voltage compensating circuit, whereby initially the output voltage of the balance is fed to the ADC, bypassing the compensating circuit and with an amplifying factor 1 of the amplifier, the highest place displayed digit can then be adjusted on the additional DDU, a compensating voltage of which can be adjusted on the compensating circuit and the amplifier can be changed over to the amplifying factor 10. The additional unit may be replaced by two additional units and the amplifier will have an amplifying factor of 100.

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**3,653,014**

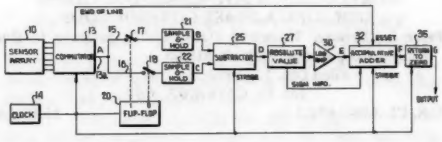
## SIGNAL VARIATION ENHANCEMENT SYSTEM

**William F. List, Linthicum, and Roland A. Anders, Baltimore, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Dec. 24, 1969, Ser. No. 887,861**

**Int. Cl. G08b** *29/00*

**U.S. Cl. 340—203** **9 Claims**



Apparatus is disclosed for enhancing small signal information level variations detected by an array of sensors. The sensors convert detected energy, such as light, to a form suitable for processing, e.g., representative electrical signals. The signals are sequentially sampled according to a predetermined sequence of scanning of the sensing element array, and are processed in parallel channels on a synchronized element-by-element basis to detect variations in sample levels. The detected variations are converted to logarithmic form to emphasize small signal variations from element to element.

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**3,653,015**

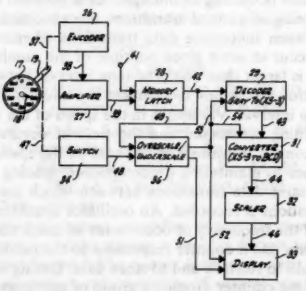
## DIGITAL SCALE AND METHOD

**Frank C. Rock, Santa Rosa, Calif., assignor to National Controls, Inc., Santa Rosa, Calif.**

**Filed June 1, 1970, Ser. No. 41,877**

**Int. Cl. G08c** *19/16*

**U.S. Cl. 340—204** **18 Claims**



Digital display system and method for weighing scales wherein an encoder provides a digital signal indicative of the

position of the dial pointer of the scale. The digital signal is converted to binary coded decimal form, multiplied by a scale factor to provide a reading in the desired increments of measure, and displayed by visual display elements such as Nixie tubes. When the scale is operating above its normal range, an overscale signal is produced which causes an overscale digit to be displayed. Below the normal range, an underscale signal causes the compliment of the digital signal to be displayed together with a minus sign.

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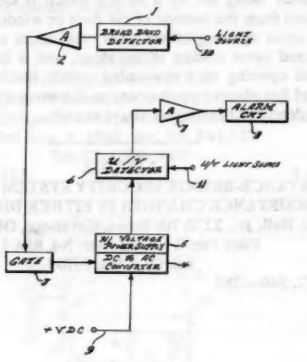
**3,653,016**

**COMBINATION VISIBLE LIGHT DETECTOR AND ULTRAVIOLET DETECTOR COACTING AS A FIRE DISCRIMINATION SYSTEM**

**Arthur R. Cormier, Uxbridge, Mass., assignor to The United States of America as represented by the Secretary of the Air Force**

**Filed Sept. 9, 1970, Ser. No. 70,705**
**Int. Cl. G08b 17/12**
**U.S. Cl. 340—228** **1 Claim**




A combination visible light and ultraviolet flame detector is provided wherein a broad band solar cell senses the presence of a visible light source in a surveyed area, and a coacting ultraviolet detector confirms or negates the presence of any ultraviolet component in the visible light, thereby indicating whether the response signifies occurrence of fire, explosion, or merely a false alarm.

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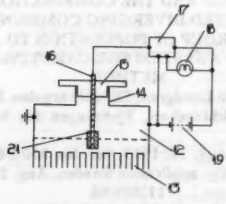
**3,653,017**

**LIQUID LEVEL INDICATOR SYSTEMS**

**Eric Bernard Parkes, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England**

**Filed Dec. 3, 1969, Ser. No. 881,761**
**Claims priority, application Great Britain, Dec. 20, 1968, 60,802/68**
**Int. Cl. G08b 21/00**
**U.S. Cl. 340—244 C** **2 Claims**



A liquid level indicator system for indicating the level of a conductive liquid in a reservoir includes a probe, at least a portion of the probe which is immersed in the liquid when the liquid level is at or above a predetermined level being coated with a layer of material which is absorbent to the conductive liquid so that a true indication of the liquid level in the reservoir is obtained.

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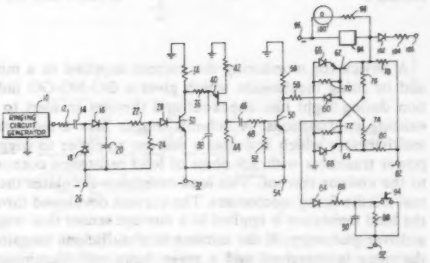
**3,653,018**

**MONITOR CIRCUIT**

**Ignas Budrys, Fairport, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.**

**Filed June 8, 1970, Ser. No. 44,182**
**Int. Cl. G08b 21/00**
**U.S. Cl. 340—248 P** **8 Claims**



The circuit of the invention monitors the amplitude, duration, and repetition rate of telephone ringing bursts. When the ringing bursts are of proper magnitude and form, a bistable circuit is maintained in a reset condition. Should the amplitude, and/or repetition rate, and/or duration, of the ringing bursts fall below specified limits, a signal developed by an integrator circuit is insufficient to prevent a pulse generator from switching the flip-flop circuit into an alarm condition.

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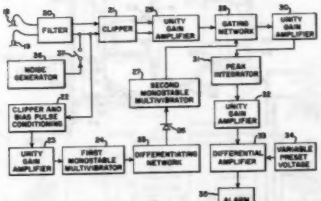
**3,653,019**

**SIGNAL MONITORING SYSTEM**

**Sterling C. Barton, and Fred H. Sawada, both of Scotia, N.Y., assignors to General Electric Company**

**Filed July 28, 1970, Ser. No. 58,902**
**Int. Cl. G08b 21/00**
**U.S. Cl. 340—248 P** **18 Claims**



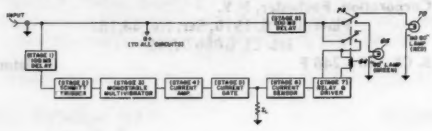

A signal processing system for monitoring the brush arcing potential at the slip rings of a generator supplied through the brushes with a field potential having recurring high-energy noise spikes in the same frequency band as the signal to be monitored, and to give an alarm when the brush arcing potential exceeds a certain critical value. The system eliminates the noise spikes by gating the signal for a preset time at a predetermined time after the occurrence of a noise spike.

3,653,020

## CURRENT MONITOR FOR THRESHOLD DETECTION

Billy B. Gullion, Reistertown, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 6, 1970, Ser. No. 61,525
Int. Cl. G08b 21/00
U.S. Cl. 340—253 P 9 Claims



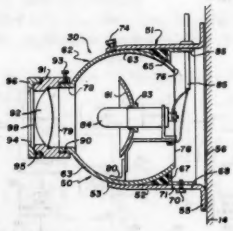
A device for monitoring the current supplied to a missile and its firing mechanism which gives a GO-NO-GO indication during flight line checkout and thereby an alert to any existing malfunctions. A Schmitt trigger fires a monostable multivibrator which activates a current amplifier to trigger a power transistor with 5.9 ohms of load resistance connected to the emitter thereof. This load resistance simulates the actual missile firing mechanism. The current developed through the load resistance is applied to a current sensor that triggers a driver and relay. If the current is of sufficient magnitude, the relay is energized and a green lamp will illuminate indicating a "GO" condition. If insufficient current is applied to the device, the relay will not energize and a red lamp will illuminate indicating a "NO-GO" condition.

3,653,021

## UNIVERSALLY ADJUSTABLE AND FOCUSABLE ALARM APPARATUS AND ELECTRIC CIRCUITRY THEREFOR

Charles Litman, 4438 Narvaez Crescent, and Earl N. Lehna, 320 Bessborough Avenue, both of Victoria, British Columbia, Canada

Filed Dec. 18, 1969, Ser. No. 886,176
Claims priority, application Canada, Apr. 14, 1969, 048,571
Int. Cl. G08b 13/18
U.S. Cl. 340—258 B 4 Claims



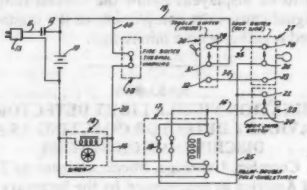
Apparatus having a base attachable to a surface. A hollow holder is universally supported by the base and an electric element of a light beam transmitting and receiving circuit is mounted in the holder. The light beam travels through an outer end opening of the holder and fitted to the holder to extend across the outer end opening are a light focusing lens and a light filter. A rheostat is provided in the circuit to adjust the intensity of the light beam. The apparatus has an alarm circuit which is energized when the light beam is broken by an object of a predetermined size and the alarm circuit includes an audible and a visual signalling device as well as a two-way switch for selectively and alternatively controlling the two devices.

3,653,022

## BURGLAR AND FIRE ALARM SYSTEM

Murry Tall, 7435 S. W. 104th Street, Miami, Fla.

Filed May 9, 1969, Ser. No. 823,384
Int. Cl. G08b 13/22
U.S. Cl. 340—274 1 Claim



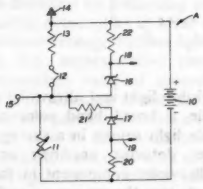
A self-contained burglar alarm system having an audible alarm operated by a low voltage battery, the circuit of the alarm being energized upon opening of a door or window only after being set by a switch which is closed by a key operated from the outside of the door or window. Once energized upon opening of the door, the alarm circuit remains energized upon closing of the door, and is broken only by manual opening of a concealed switch inside the door. A parallel fire alarm circuit operates the same alarm device independently of the burglar alarm circuit.

3,653,023

## RESISTANCE-BRIDGE SECURITY SYSTEM DETECTING RESISTANCE CHANGES IN EITHER DIRECTION

Roy O. Hall, Jr., 2273 7th Street, Coyahoga, Ohio

Filed Dec. 11, 1969, Ser. No. 884,120
Int. Cl. G08b 13/00
U.S. Cl. 340—285 2 Claims



An electronic security system capable of monitoring a plurality of stations for an intrusion. A current balancing unit consists of two balanced electronic detection systems which can recognize an increase or decrease of resistance at any of said stations, said increase and/or decrease in resistance created by an intrusion. Upon such a detection, the electronic system becomes unbalanced and a current will flow to operate periphery equipment which sounds an alarm or otherwise warns of the intrusion.

3,653,024

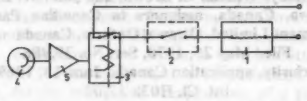
## METHOD OF SELECTED CONVERGING COMMUNICATION AND THE COMBINATION THEREOF WITH SELECTED DIVERGING COMMUNICATION BETWEEN A GROUP OF POPULATION TO A REMOTE CENTER, AND A SYSTEM FOR CARRYING OUT THE METHOD

Claes Erik Gunnar Lundgren, Stora Tvargatan 36, and Istvan Janos Antal Lichtneckert, Fjelievagen 23, both of Lund, Sweden

Filed Aug. 18, 1969, Ser. No. 850,948
Claims priority, application Sweden, Aug. 22, 1968, 11,329/68
Int. Cl. H04q 1/00, 3/00
U.S. Cl. 340—310 8 Claims

A voting system for compiling a vote on alternative questions distributed by a mass medium. A vote is placed by

the manual connection of a load to a public supply system, by a voter at an instant and during a period determined by a control signal transmitted from a remote center. The total load measured during this period is compared with the background load measured immediately before and/or after the period, so that the relationship of the two measurements is a measure of the number of votes. In a simple form, the



device for voting may be a small box comprising the load in series with the manual switch, and a photocell controlling a relay having a switch in series with the manual switch and the load. The control signals are transmitted by television and displayed on the screen of the television receiver to activate the photocell so that the load is automatically connected to the supply if the manual switch is on.

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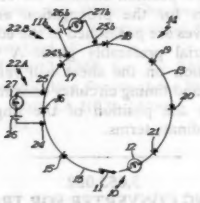
**3,653,025**

**SIGNALLING SYSTEM**

**Theodore N. Busch, Minneapolis, Minn., assignor to Caswell Equipment Company, Incorporated, Minneapolis, Minn.**

**Filed Aug. 4, 1969, Ser. No. 847,127**
**Int. Cl. G08b** *5/00*
**U.S. Cl. 340—323** **1 Claim**



A loop communicating system in which the loop is conductors alternated with diodes. A partial loop electrical circuit has brushes that contact the loop so as to complete the partial loop using a single conductor of the loop or, by contacting two conductors of the loop, incorporated the diode between two conductors into the partial loop. The differences between these two arrangements electrically is used to signal the changes in position of the partial loop on the loop.

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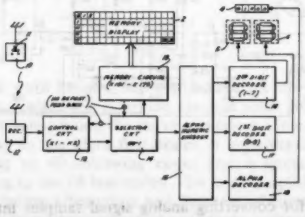
**3,653,026**

**RANDOM SELECTION SYSTEM FOR BINGO AND THE LIKE**

**Frederick A. Hurley, 1204 Ali Baba Avenue, Opa Locka, Fla.**

**Filed June 3, 1970, Ser. No. 42,964**
**Int. Cl. G08b** *5/36*
**U.S. Cl. 340—323** **9 Claims**



A random selection system including a repeating selector operating for a randomly varied period of time following each successive actuation. The random period of time is achieved through a capacitor timing circuit by means of a variable charging time, and changes in capacitance and other circuit parameters.

A memory circuit keeps track of the selected numbers and is coupled to the selector control circuits to prevent a repeat selection of any number.

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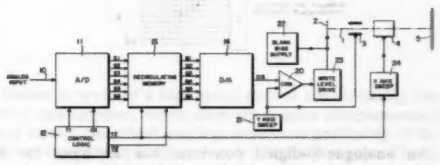
**3,653,027**

**PRECESSING ANALOG TRACE DISPLAY**

**David W. Scheer, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed June 15, 1970, Ser. No. 46,233**
**Int. Cl. H01j** *29/70*
**U.S. Cl. 340—324 A** **4 Claims**



A signal display circuit includes an analog to digital converter, a recirculating memory, a digital to analog converter, and a CRT display means. The memory and the display means are synchronized so that a bright spot representative of the information contained in one location of the memory is produced on the display means for each shifting of information in the memory. New information replaces existing information in the memory at a rate less than the shifting rate of the memory so that the displayed signal appears to move across the viewing screen at a variable speed and with a constant brightness. When no new information is fed into the memory, the display means will continue to show the position of the signal as represented by the data stored in the memory.

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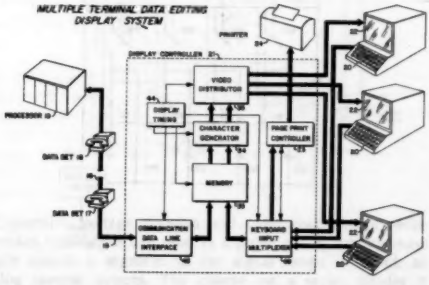
**3,653,028**

**CODE CONVERSION DEVICE FOR MULTIPLE TERMINAL DATA EDITING DISPLAY SYSTEM**

**Allen B. J. Cuccio, Oklahoma City, Okla., assignor to Honeywell Information Systems Inc.**

**Filed Aug. 29, 1967, Ser. No. 664,057**
**Int. Cl. G06f** *3/14*
**U.S. Cl. 340—324 A** **12 Claims**



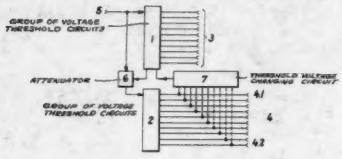

A network system utilizing a data processor and a plurality of remotely located visual display terminals for random access and data editing display of coded information.

3,653,029

## ANALOGUE TO DIGITAL CONVERTER

Joachim Kuhlmann, Heilbronn-Bockingen, Germany, assignor to Licentia, Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Feb. 17, 1970, Ser. No. 12,013
Claims priority, application Germany, Feb. 22, 1969, P 19 09 032.5
Int. Cl. H03k *13/175*
U.S. Cl. 340—347 AD 13 Claims



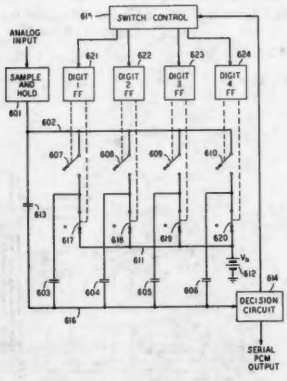

An analogue-to-digital converter has an input for an analogue signal and a plurality of signal outputs each associated with a different voltage threshold, direct voltage signals being produced at a signal output when the analogue signal exceeds the associated voltage threshold, the threshold associated with at least one signal output being variable between upper and lower values in the same sense or direction as variations in amplitude of the analogue signal and being abruptly changed in the opposite sense between these values when the analogue signal reaches a predetermined intermediate value.

3,653,030

## SWITCHED DIVIDER PCM CODERS AND DECODERS

Robert Lawrence Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 3, 1970, Ser. No. 25,519
Int. Cl. H03k *13/10*
U.S. Cl. 340—347 AD 1 Claim



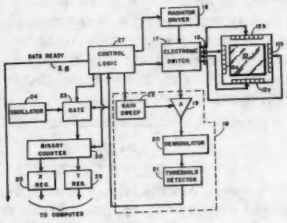

A plurality of weighted impedances is used in a switched divider configuration to produce self-compressing PCM encoders and self-expanding PCM decoders. For the encoders, the analog sample voltage is used as a reference voltage and the divider voltage is compared with a zero volt decision level for subsequent switch operation. For the decoders, a DC reference is used, and after the switches have been set in response to digital information, the divider voltage represents an analog sample voltage.

3,653,031

## TOUCH-SENSITIVE POSITION ENCODER

Alvin M. Hlady; William C. Brown, and John W. Brahan, all of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed May 25, 1970, Ser. No. 39,986
Claims priority, application Canada, June 13, 1969, 54287
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 AD 9 Claims



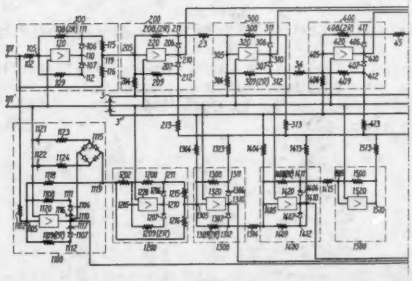

A touch-sensitive position encoder for computer input in which transducers for the propagation and reception of elastic surface waves are positioned at the edges of a sheet of transparent material preferably glass. A finger or stylus placed at a position on the sheet will reflect the surface waves. Detecting and timing circuitry connected to the transducers determine the position of the finger or stylus in geometrical co-ordinate terms.

3,653,032

## COMPRESSING CONVERTER FOR TRANSLATING ANALOG SIGNAL SAMPLES INTO PULSE CODE MODULATION SIGNALS

Gilbert J. Le Fort, 28 Residence Corlay, Lannion, France

Filed Oct. 20, 1970, Ser. No. 82,420
Claims priority, application France, Oct. 29, 1969, 6937201
Int. Cl. H03k *13/06*
U.S. Cl. 340—347 AD 3 Claims



A device for converting analog signal samples into PCM signals, comprising means for successively comparing to a predetermined reference voltage the amplitude of each sam-

ple and the successive products thereof by increasing powers of two. At each comparison showing said amplitude of one of said products to be smaller than said reference voltage, a binary digit of a given signalling condition is generated, while a binary digit of the other signalling condition is generated as soon as a comparison shows one of said products to exceed said reference voltage. A remainder signal derived from the latter comparison is transmitted to a linear PCM coder, which delivers a first sequence of PCM signals, while a computer translates the sequence formed by the above-said digits into a second sequence of PCM signals. The assembly of both sequences constitutes the ready-to-be-transmitted PCM signal groups. The device is further characterized in that it makes use, for the successive comparisons, of a plurality of cascaded circuits, each of which includes a difference amplifier with two negative feedback paths, one including a diode having its conduction direction from the output to the input of the amplifier and series connected with a resistance, and the other including a diode having the reverse conduction direction and series-connected with another resistance equal to half or twice the preceding one according to the even or odd rank of the amplifier in the cascade. Thanks to this arrangement, the difference signal resulting from each comparison is multiplied by 1 or 2 according to its polarity, this allowing to use a common reference voltage for all stages of the cascade.

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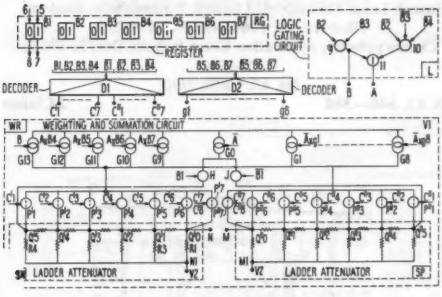
**3,653,033**

## NON-LINEAR DECODER WITH LINEAR AND NON-LINEAR LADDER ATTENUATORS

**Robert Raoul Charles Bonami, Paris; Claude Paul Henri Lerouge, Maurepas, and Didier Charles Strube, Garches, all of France, assignors to International Standard Electric Corporation, New York, N.Y.**

**Filed June 23, 1969, Ser. No. 842,074**
**Claims priority, application France, June 25, 1968, 156404**
**Int. Cl. H03k** *13/04*
**U.S. Cl. 340—347 DA** **6 Claims**



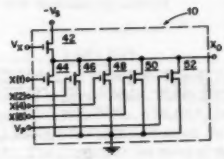

A PCM word decoder has a characteristic curve which is symmetrical with respect to zero abscissa point. Starting from the zero abscissa point, the curve comprises a linear part corresponding to the eight first codes, a logarithmic part corresponding to 40 following codes and a linear part corresponding to the 16 last codes. This is accomplished by two identical ladder attenuators and two sets of current generators. One attenuator and set of generators correspond to the logarithmic part, and the other to the linear part.

**3,653,034**

## HIGH SPEED DECODE CIRCUIT UTILIZING FIELD EFFECT TRANSISTORS

**William M. Regitz, Franklin, Mass., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Feb. 12, 1970, Ser. No. 10,828**
**Int. Cl. H03k** *17/00*; **G06f** *5/02*
**U.S. Cl. 340—347 DD** **11 Claims**



Herein is revealed a high speed decode circuit having low power consumption, which does not require complementary input signals and which employs transistors preferably of the MOS (Metal Oxide Semiconductor) field effect type. The illustrated embodiment is a decode circuit having a binary input and one of 16 outputs. A plurality of subcircuits are included in the decode circuit, each of which subcircuits includes at least one transistor in a series arrangement connected to at least one transistor in a parallel arrangement, the connection therebetween forming one of the outputs. A select signal is generated on one of the outputs of a particular subcircuit when each of its transistors in series arrangement are conductive and when each of its transistors in parallel arrangement are nonconductive.

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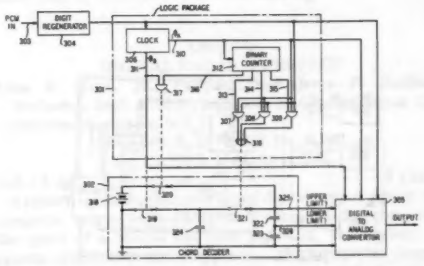
**3,653,035**

## CHORD LAW COMPANDING PULSE CODE MODULATION CODERS AND DECODERS

**Robert Lawrence Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Apr. 24, 1970, Ser. No. 31,489**
**Int. Cl. H03k** *13/02*
**U.S. Cl. 340—347 C** **4 Claims**



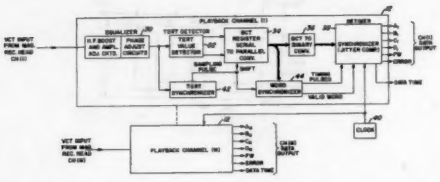

Capacitive voltage division and capacitive charge redistribution techniques are used in a pulse coding arrangement which selects a segment of the signal range in which an analog sample occurs. The charge on a series divider is periodically compared with the analog sample, and stored charge is subsequently redistributed in accordance with the comparison results. The invention produces a chord law characteristic, and is suitable for operation with PCM coders or decoders.

3,653,036

## INFORMATION HANDLING SYSTEM ESPECIALLY FOR MAGNETIC RECORDING AND REPRODUCING OF DIGITAL DATA

John S. Whiting, Ontario County, N.Y., assignor to General Dynamics Corporation

Filed Nov. 14, 1969, Ser. No. 876,973
Int. Cl. H03k 13/24
U.S. Cl. 340—347 DD 4 Claims



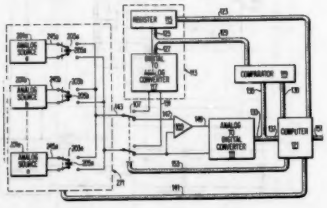
A system for storage on a magnetic record medium (tape or disc) of data with an extremely high packing density is described. Binary input information is encoded into a ternary signal for recording. That ternary signal has spectral properties which facilitate recording with extremely high bit packing density. The ternary signal also contains timing information. On playback the signal is decoded into binary coded ternary form. Timing information with respect to words of ternary data, as well as the individual terts which make up the words, is also derived. The system includes mans for synchronizing the reproduced data in accordance with the timing information derived from the data itself, as well as with an external clock, and decodes the data into the original binary form.

3,653,037

## APPARATUS AND A METHOD FOR AUTOMATICALLY TESTING A SYSTEM WHICH RECEIVES AN ANALOG INPUT SIGNAL

Brian G. Utley, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,440
Int. Cl. H03k 13/02
U.S. Cl. 340—347 AD 3 Claims



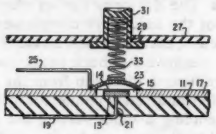
A testing system which periodically applies an analog test signal to an input storage capacitor and converts the value of the voltage stored on the capacitor to a digital number which is compared with an original digital test signal. Failure of the capacitor, an analog-to-digital converter or an intervening amplifier is detected by the comparator because the two signals will not agree. An error signal is generated by the comparator in the event of such a failure.

3,653,038

## CAPACITIVE ELECTRIC SIGNAL DEVICE AND KEYBOARD USING SAID DEVICE

James R. Webb, and Richard C. Webb, both of Boulder, Colo., assignors to United Bank of Denver National Association, Denver, Colo.

Filed Feb. 20, 1970, Ser. No. 13,091
Int. Cl. G08c 5/00
U.S. Cl. 340—365 30 Claims



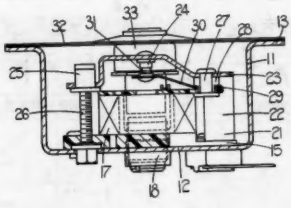
This disclosure describes electric signal devices of a capacitive nature. A metallic target which may or may not have a permanently charged dielectric material mounted on its upper surface is located beneath a semi-hemispherical dome spring. Located above the dome spring is a push button or key element which, when depressed, changes the separation distance between the dome spring and the target in a "snap" action manner. This action causes a rapid decrease in the voltage between the target and the dome spring which decrease is in the form of a signal pulse. This disclosure also describes splitting the target into two or more segments and connecting the segments to a plurality of electrical signal devices in a matrix arrangement. The keys or push button elements are mounted in a keyboard arrangement such that when individual keys are depressed coded symbols which represent information about the depressed key are generated. The coded symbols are suitable for direct entry into digital data systems, displays and/or computers.

3,653,039

## ELECTRO-MAGNETIC HORNS

John Edward Hoare, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Nov. 5, 1969, Ser. No. 874,252
Claims priority, application Great Britain, Dec. 2, 1968, 57043/68
Int. Cl. G08b 3/00
U.S. Cl. 340—388 2 Claims

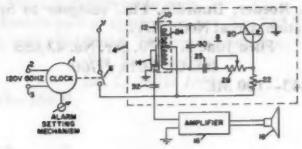


An electromagnetic horn has a cup-shaped housing the base of which is flat. Supported on the base is an electromagnet in circuit with which is a contact assembly supported by the housing. Both the contact assembly and the electromagnet are within the housing, and a diaphragm closes the upper part of the housing and carries the armature of the electromagnet, which in use is attracted and operates the contacts to deenergize the electromagnet in the usual way.

## 3,653,040
## ELECTRONIC CHIME ALARM

Yates M. Hoag, Utica, N.Y., assignor to General Electric Company

Filed Jan. 30, 1970, Ser. No. 6,993
Int. Cl. G04c *21/28*; G10k *10/00*
U.S. Cl. 340—392 13 Claims

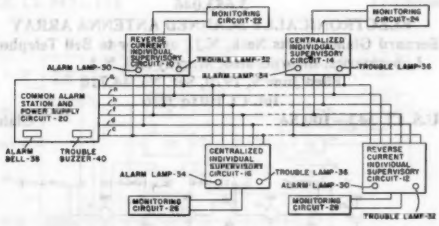



An electronic chime alarm includes a Hartley oscillator having a center-tapped coil which is electromagnetically coupled to a magnetic reed. The reed is supported at one end thereof by a yoke arrangement. By design, the oscillator may pulse the reed at a frequency lower than the reed's resonant frequency. The resultant reed vibrations, which include harmonics dependent upon reed structure, of which a number of examples are shown, may be coupled to an amplifier and a speaker by either a nonmagnetic transducer or by a filter circuit connected across the coil. In addition, various examples of an oscillator unit structure including the reed, yoke, coil and transducer are illustrated. Finally, various switching arrangements which enable the chime alarm to be used with standard synchronous motor clocks or with clock-radios are described.

## 3,653,041
## ANNUNCIATOR SYSTEM

William W. McGrath, Holliston; Robert B. McLeod, Clinton, both of Mass.; Philip L. Reichle, deceased, late of Mass., and Dorothy K. Reichle, administratrix, Acton, Mass., assignors to Gulf & Western Systems Company, New York, N.Y.

Filed Dec. 2, 1969, Ser. No. 881,479
Int. Cl. G08b *29/00*
U.S. Cl. 340—409 24 Claims

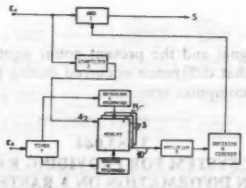



There is provided an annunciator system for indicating that an alarm condition exists at any of a plurality of remote station monitoring circuits having a like plurality of supervisory circuits, each associated with one of the monitoring circuits, and a central station common circuit which is coupled to each of the supervisory circuits. An alarm signal, indicative of an alarm condition at the remote station, is detected by an associated supervisory circuit, which in turn actuates an alarm indicator in the supervisory circuit and in the central station common circuit. A disruption in the circuit connection between one of the remote station monitoring circuits and the associated supervisory circuit is detected by the associated supervisory circuits, which in turn actuates a trouble indicator in the supervisory circuit and in the central station common circuit. The supervisory circuits are compatible with both remote station monitoring circuits which provide an alarm signal by increasing the magnitude of a current flowing in the monitoring circuit, and remote monitoring circuits which provide an alarm signal by changing the direction of a current flowing in the monitoring circuit.

## 3,653,042
## DIGITAL SIGNAL-PROCESSING SYSTEM

Fred Molho, 12 Rue de la Marseilleise, Paris 19, France

Continuation of application Ser. No. 376,883, June 22, 1964, now Patent No. 3,386,077. This application Feb. 27, 1968, Ser. No. 708,537. The portion of the term of this patent subsequent to May 28, 1985, has been disclaimed.
Int. Cl. G01s *9/00*
U.S. Cl. 343—5 DP 1 Claim



In a radar installation or the like, incoming multidigit signals are registered in a memory having as many stages as there are digital positions in a signal. In order to discriminate against parasitic signals, correspondingly positioned digits of an incoming signal and a preceding signal already registered in the memory are compared; to compensate, however, for unavoidable delays in the registration of each incoming digit, the digits of the preceding signal are read out from memory stages that are staggered with reference to the stages in which the incoming digits are concurrently inscribed, the offset between the inscribed and the readout stages being equal to M<N where N is the total number of stages. Advantageously, M is chosen to provide a readout delay equaling the time lag introduced by the recording equipment in the inscribing operation; in certain instances, however, the delay may be chosen to exceed the time lag.

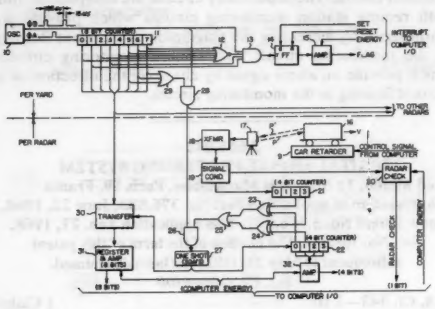
## 3,653,043
## DIGITAL RADAR INTERFACE

John H. Auer, Jr., Fairport, and Jerry P. Huffman, Rochester, both of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Feb. 6, 1970, Ser. No. 9,257
Int. Cl. G01s *9/44*; B61l *3/00*
U.S. Cl. 343—8 7 Claims

Registry apparatus for generating digital output signals to a computer representing parameters necessary for computing the speed of a vehicle has been provided. The registry apparatus responds to radar apparatus which provides doppler shift frequency signals representative of the velocity of the moving vehicle. The improvement in the present invention includes an accumulator means responsive to the doppler pulses for producing a count signal representative of the number of pulses at prescribed counts. Timing cycle means coupled to the computer produces a pulsed output and generates a scan signal to the computer over a selected interval of the cycle while synchronizing means responds to the accumulator means and the timing cycle means producing a register pulse at the prescribed counts. Output means coupled to the computer stores the total accumulator count

signal and the timing cycle pulses for each registered pulse since the previous scan signal and provides an output to the computer for processing the differences between the previ-



ous count signal and the present count signal and the time over which that difference occurred during the selected interval of the computer scan.

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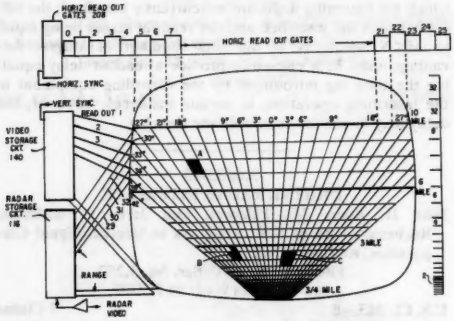
**3,653,044**

**DISPLAY SYSTEM FOR PROVIDING RADAR PLAN POSITION INFORMATION ON A RASTER DISPLAY**

**Eric G. Breeze, Los Altos, and John O. Sabel, Sunnyvale, both of Calif., assignors to Kaiser Aerospace & Electronics Corporation, Oakland, Calif.**

**Filed Sept. 22, 1969, Ser. No. 859,809**
**Int. Cl. G01s 7/10**
**U.S. Cl. 343—5 SC** **29 Claims**



A display system for use in the presentation of radar plan information on the same display device used for television camera video and radar profile presentation. Radar video provided by a conventional radar set is gated into temporary storage registers for selective gating to a storage matrix made up of multibin registers, each of which registers stores the radar information detected along a given azimuth, the different bins of each register storing the information for different ranges along the azimuth represented by the register. Readout from the storage matrix is by a nonlinear vertical clock train which provides higher resolution for closer ranges and horizontal pulses of different widths for different vertical raster positions which result in radial sectors which become progressively narrower at the bottom of the display to further increase resolution for closer ranges. The radar plan information is converted to a raster format to permit the display thereof on the same cathode ray tube with other information required in aircraft presentations.

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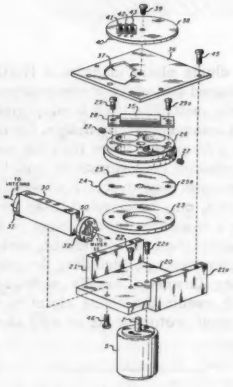
**3,653,045**

**RADIOMETER MODULATOR-DEMODULATOR SYSTEM**

**Robert S. Roeder, Dunedin, Fla., assignor to Sperry Rand Corporation, Great Neck, N.Y.**

**Filed June 3, 1970, Ser. No. 43,055**
**Int. Cl. G01k 11/00**
**U.S. Cl. 343—100 ME** **8 Claims**



An improved microwave radiometer of the comparison type features simplified construction through the employment of a unitary modulator-demodulator system operating on the high frequency signal to be investigated by cyclically sampling and exposing the signal to be investigated and a reference signal to synchronous demodulation by a demodulator element constructed integrally with the high frequency sampling switch or chopper.

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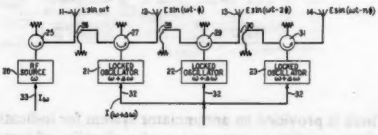
**3,653,046**

**ELECTRONICALLY SCANNED ANTENNA ARRAY**

**Bernard Glance, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed June 9, 1970, Ser. No. 44,716**
**Int. Cl. H01q 3/26**
**U.S. Cl. 343—100 SA** **7 Claims**



A phased array antenna system in which the phase of successive radiating elements is produced by a series of injection locked oscillators each driven by or locked to the signal fed to the preceding elements. Since the phase of an injection locked oscillator depends upon the difference between its natural frequency and its injected frequency, the array may

be scanned either by varying the injected frequency or the natural frequency. IMPATT diode oscillators are preferred because of the ease with which they can be injection locked and/or varied in frequency.

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3,653,047

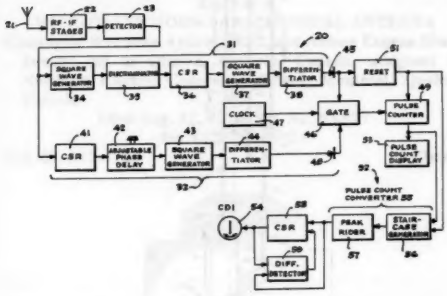
## AIRCRAFT NAVIGATION RECEIVER APPARATUS

Myron L. Anthony, La Grange, Ill., assignor to Thomas E. Dorn, Clarendon Hills, Ill. and Statistical Services, Inc., Chicago, Ill., a part interest to each

Continuation-in-part of application Ser. No. 713,786, Mar. 18, 1968, now abandoned. This application Dec. 18, 1969, Ser. No. 886,054

Int. Cl. G01s 1/46

U.S. Cl. 343—106 R 20 Claims



A digital aircraft navigation receiver for comparing two constant-frequency received signals to determine the aircraft orientation, in which the received signals are differentiated to produce two gating signals; the gating signals are used to open and to close a gate that applies high-frequency clock pulse signals to a pulse counter, the counter being reset to zero in each cycle of one of the gating signals. The count in the counter determines the aircraft orientation.

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3,653,048

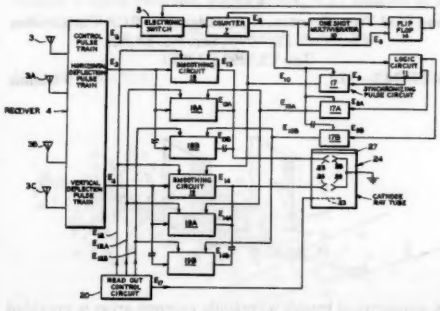
## SYSTEM FOR STABILIZING A VISUAL DISPLAY

Hayes B. Steinhauser, Lincoln Park, N.J., assignor to The Bendix Corporation

Filed June 25, 1969, Ser. No. 836,352

Int. Cl. G01s 5/08

U.S. Cl. 343—112 11 Claims



A circuit for stabilizing the display on a cathode ray tube representing the position of transmitting beacons outlining the runway of an airport on which an aircraft is about to land. The beacons transmit pulses which are received by a receiver in the aircraft. Some of the transmitted pulses reflected from the ground are received simultaneously with the transmitted pulses and cause the display to bounce. The stabilizing circuit includes averaging circuits for averaging the transmitted and reflected pulses from each beacon to reduce the effect of the reflected pulses and stabilize the display.

A read out control circuit periodically applies the averaged pulses to deflection means of a cathode ray tube. A synchronizing circuit controls the averaging circuits so that only the pulses from a single beacon are applied to the averaging circuits associated with the beacon.

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3,653,049

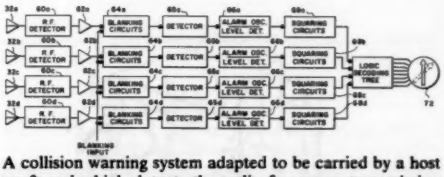
## COLLISION WARNING SYSTEM

Patrick T. Thayer, and Robert V. Munson, both of Antonio, Tex., assignors to Marquart Industrial Products Co., Cucamonga, Calif.

Filed Dec. 5, 1969, Ser. No. 882,534

Int. Cl. G01s 3/22; G08g 5/04

U.S. Cl. 343—112 CA 25 Claims



A collision warning system adapted to be carried by a host aircraft and which detects the radio frequency transmission from an intruder aircraft in its vicinity. The antenna arrangement provides information as to the compass quadrant of the other aircraft while changes in the intensity of the received radio frequency signals are displayed to provide an indication of the closure rates between the two aircraft.

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3,653,050

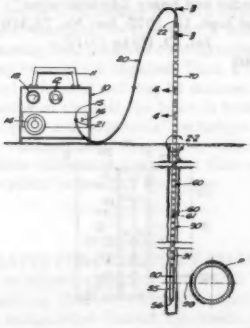
## PIPE LOCATOR METHOD AND APPARATUS

Herbert L. Eggleston, Jr., Glendale, Calif., assignor to The Goldak Company, Inc., Glendale, Calif.

Filed Dec. 29, 1969, Ser. No. 888,445

Int. Cl. G01s 11/00

U.S. Cl. 343—112 D 10 Claims



A method is disclosed of measuring the depth of an underground pipe by drilling a vertical hole which extends below and beside the pipe, transmitting electromagnetic energy into the pipe, coupling a small antenna to a receiver which is tuned to the frequency at which the pipe is ener-

gized, dropping the antenna down into the hole, and observing the maximum signal indicated by the receiver as the center of the antenna reaches the depth of the pipe.

Also disclosed is a receiver having a flexible cable connected to its input, the other end of the flexible cable being connected to the upper end of a handle member, the handle member having a small antenna attached to its lower end as an extension thereof, and including conductor means carried by the handle member which electrically connects the antenna to the flexible cable. More specifically, the antenna is disclosed as a small ferrite rod antenna, and the handle member as a metallic tube having an insulated coaxial conductor carried within its interior, the upper end of the handle member being threaded for the threaded attachment of a superimposed handle member extension and also having a jack for connection of the flexible cable.

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**3,653,051**

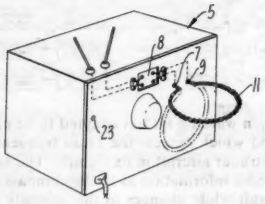
**ADJUSTABLE CONFIGURATION UHF LOOP ANTENNA**

**David J. Wu, 7672 Greenback Lane, Citrus Heights, Calif.**

**Filed May 20, 1970, Ser. No. 39,001**

**Int. Cl. H01q** *11/12*

**U.S. Cl. 343—702** **3 Claims**




A built-in television antenna, particularly suitable for use as a UHF antenna, is made of a loop of convoluted metal tubing.

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**3,653,052**

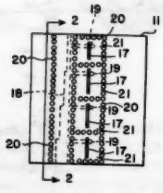
**OMNIDIRECTIONAL SLOT ANTENNA FOR MOUNTING ON CYLINDRICAL SPACE VEHICLE**

**Thomas G. Campbell, Crittenden, and Meredith W. Appleton, Yorktown, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration**

**Filed Sept. 18, 1970, Ser. No. 73,310**

**Int. Cl. H01q** *13/10*

**U.S. Cl. 343—708** **9 Claims**




An extremely thin microwave array antenna which is bonded, circumferentially to the outside surface of a spacecraft and coated with a dielectric for thermal protection. This antenna was designed for a specific payload application in the S-band (2,200 to 2,300 MHz.) frequency range and provides an omnidirectional radiation pattern in the plane of the array and a near-omnidirectional pattern in the planes perpendicular to the array.

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**3,653,053**

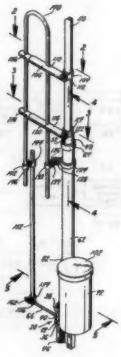
**MULTI-BAND MONOPOLE ANTENNA WITH ADJUSTABLE TUNING**

**Wallace E. St. Vrain, and Gerald H. French, both of St. Louis, Mo., assignors to Mosley Electronics Inc., Bridgeton, Mo.**

**Filed June 15, 1970, Ser. No. 46,269**

**Int. Cl. H01q** *9/00*

**U.S. Cl. 343—745** **16 Claims**



An antenna, which has a plurality of coaxial, generally cylindrical portions interconnected by a plurality of parallel-resonant traps to enable it to transmit or receive signals at one or more relatively high frequencies, is connected to a transmission line by a fixed capacitor, a fixed inductor, and an adjustable inductor which are connected in parallel with each other. That capacitor, fixed inductor and adjustable inductor are located adjacent the lower end of that antenna; and they enable that antenna to continue to transmit or receive signals at the said one or more relatively high frequencies, while also enabling that antenna to receive or transmit signals at a lower frequency — without increasing the overall length of that antenna.

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**3,653,054**

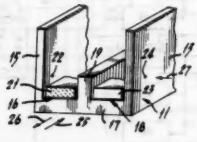
**SYMMETRICAL TROUGH WAVEGUIDE ANTENNA ARRAY**

**Cheng Paul Wen, Trenton, N.J., assignor to RCA Corporation**

**Filed Oct. 28, 1970, Ser. No. 84,821**

**Int. Cl. H01q** *13/00*

**U.S. Cl. 343—772** **9 Claims**




A symmetrical trough waveguide antenna array is provided wherein a section of trough waveguide has spaced radiating mode conversion portions. Each of the radiating mode conversion portions includes a member of gyromagnetic material spaced between the center fin and one of the side walls of the trough waveguide and a member of dielectric material

spaced between the center fin and the opposite side wall. When an appropriate DC magnetic field is applied to the gyromagnetic member, signals propagating in one direction along the trough waveguide are converted from the even to the odd mode and consequently radiation of some of the signals occurs at the spaced portions of the waveguide. The section of trough waveguide further includes phase shifter portions. Each of the phase shifting portions includes a pair of members of gyromagnetic material with one of the pair between the center fin and one side wall and the other of the pair between the center fin and the side wall opposite the one side wall. When appropriate DC magnetic field bias is applied to the pair of gyromagnetic members associated with the phase shifter portion, a difference in phase occurs between the spaced radiating mode converting elements.

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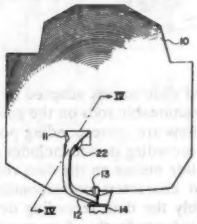
**3,653,055**

**MICROWAVE HORN-PARABOLOIDAL ANTENNA**

**Chuang-jy Wu; John Andrew Roth, and Allison Eugene Shankowski, all of Ottawa, Ontario, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada**

**Filed Aug. 12, 1970, Ser. No. 63,977**
**Int. Cl. H01q *19/24***
**U.S. Cl. 343—781** **5 Claims**



A horn-paraboloidal antenna in which a discontinuity is introduced into the feed horn so as to excite higher-order modes from the dominant mode. The various modes are phased in order to radiate a main lobe and side lobes from the horn. The latter lobes reflect from the paraboloid out-of-phase with the main lobe so as to produce a far field radiation pattern having a more uniform signal strength for a given beam angle.

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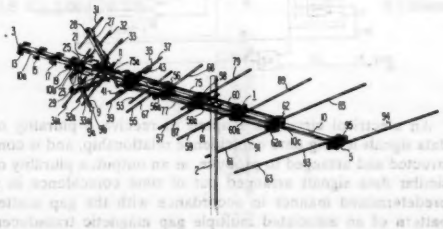
**3,653,056**

**COMBINED VHF-UHF DIPOLE ANTENNA ARRAY**

**Donald William Peterson, Maple Shade, N.J., assignor to RCA Corporation**

**Filed May 27, 1970, Ser. No. 40,862**
**Int. Cl. H01q *21/12***
**U.S. Cl. 343—795** **20 Claims**



A plurality of center fed dipole elements with the center portions of the dipole elements connected to each other by a transmission line feed. Each center fed dipole element has two conductive rodlike half portions which overlap near the center feed portion and extend in opposite directions from the center feed. One of the center fed dipole elements has a length determined so as to be full wave resonant at a frequency within the high VHF television frequency band. Another one of the center fed dipole element has a length determined to be half wave resonant at the low VHF television frequency band and has two conductive rodlike half portions which overlap near the center feed to provide increased performance of the combination of center fed dipoles over the entire high VHF television frequency band.

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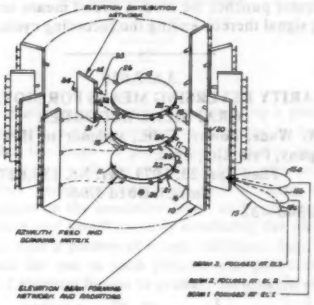
**3,653,057**

**SIMPLIFIED MULTI-BEAM CYLINDRICAL ARRAY ANTENNA WITH FOCUSED AZIMUTH PATTERNS OVER A WIDE RANGE OF ELEVATION ANGLES**

**Gregory G. Charlton, Calabasas, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Dec. 24, 1970, Ser. No. 101,300**
**Int. Cl. H01q *3/26***
**U.S. Cl. 343—854** **8 Claims**



A simplified multi-beam cylindrical array antenna system in which the feed and scanning system is simplified. Radiator elements grouped into columns are fed by a beam-forming matrix which has a number of input ports, each corresponding to a discrete elevation beam angle. The ports of the beam-forming matrix are grouped together in zones, each zone being fed by a combining network having a single common or input terminal. In this way, a smaller number of azimuth scanning feed matrices corresponding to the number of combining networks is required. Thus, a fan-shaped beam (in elevation) is formed and may be scanned in azimuth. The focusing quality of the said fan beam is better than obtainable with the prior art "separable" technique and approaches that of the "independent" technique, while requiring comparatively little additional equipment than necessary in the simpler, so-called "separable" technique.

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**3,653,058**

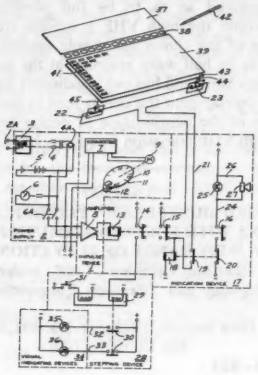
**APPARATUS FOR FREQUENCY STUDIES USING PUNCHED CARDS OR PUNCHED TAPES**

**Carl A. Sundberg, Kallhall, Sweden, assignor to AB Konsulterna For Industri Och Handel, Djursholm, Sweden**

**Filed May 4, 1970, Ser. No. 34,451**
**Claims priority, application Sweden, May 5, 1969, 6295/69**
**Int. Cl. G01d *1/00***
**U.S. Cl. 346—17** **8 Claims**

An apparatus for performing frequency studies by employing punched cards includes a randomly occurring impulse generator wherein each impulse initiates an alerting signal. The alerting signal indicates to an operator that he should

punch the card at a position indicated by the one of a plurality of lamps which is energized by a stepping device. When



the operator punches the card, a circuit means terminates the alerting signal thereby ending the recording cycle.

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**3,653,059**

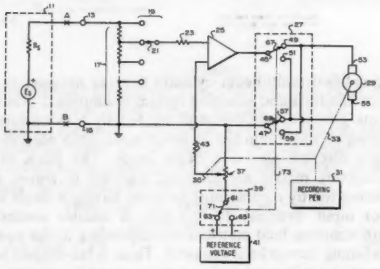
**POLARITY REVERSING MEANS FOR MOVING PEN GRAPHICAL RECORDER**

**John M. Wade, Poway, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Apr. 23, 1971, Ser. No. 136,827**

**Int. Cl. G01d** *3/06*

**U.S. Cl. 346—32** **3 Claims**



A circuit for a moving pen graphical recorder has a first polarity reversing switch coupled between a servoamplifier and a servomotor which drives the pen, and a second polarity reversing switch coupled between a reference voltage source and a variable position feedback potentiometer responsive to pen movements.

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**3,653,060**

**SYSTEM AND COMPONENTS FOR GENERATING, STORING AND RECORDING VARIABLE DATA**

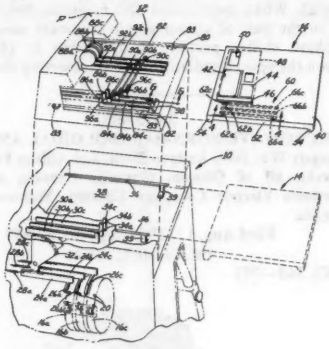
**Fritz A. Deutsch, Euclid, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio**

**Filed Jan. 30, 1970, Ser. No. 7,049**

**Int. Cl. B67d** *5/24*

**U.S. Cl. 346—43** **16 Claims**

A system is provided which incorporates apparatus for sensing and generating as linear rod positions the amount registered on the indicia wheels of dispensing pumps, a date receiving and storing device adapted to be inserted into the pump for receiving and storing the data from the data generating device as linear positions of slide means, and a data recording device adapted to receive the data receiving and storing device and record the data retained by the receiving and storing device. The linearly positionable rods are coactable with stop means on the surface of the indicia wheels to provide a linear position corresponding to the data on the indicia wheels; the data receiving and storing device



includes detented slide means adapted to sense the position of the linearly positionable rods on the generating device and retain said positions are corresponding positions of the slide means; the data recording device includes means to sense the position of the slide means on the data receiving and storing device and print characters corresponding to the position thereof. Preferably the data recording device is adapted to function either independently of or mounted on the pump and in conjunction with the operation of the data generating device.

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**3,653,061**

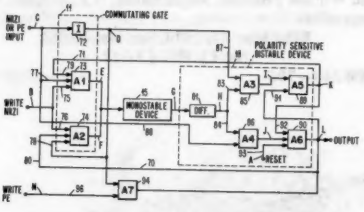
**DIGITAL DATA WRITE DESKEWING MEANS**

**Lewis S. Frauenfelder, and Judson A. McDowell, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed July 20, 1970, Ser. No. 57,382**

**Int. Cl. G11b** *5/06, 5/44, 23/18*

**U.S. Cl. 346—74 M** **9 Claims**




An electrical circuit is adapted to receive a plurality of data signals having time coincidence relationship, and is constructed and arranged to produce, as an output, a plurality of similar data signals arranged out of time coincidence in a predetermined manner in accordance with the gap scatter pattern of an associated multiple gap magnetic transducer; the electrical circuit including a plurality of individual circuits, each of which includes a commutating gate, a monostable device having a timing interval which is shorter than the

shortest period between transition of the data signal, and a bistable device connected to the output of the monostable device and responsive only to the trailing edge of its output pulse, the output of the bistable device being connected to control the commutating gate and also constituting a time delayed output data signal.

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3,653,062

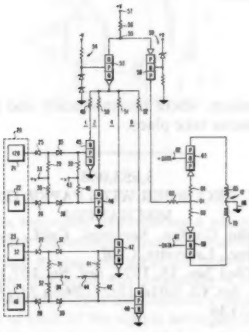
## INFORMATION STORAGE RECORDING SIGNAL AMPLITUDE CONTROL

**Carl P. Hollstein, Jr., San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of application Ser. No. 770,171, Oct. 24, 1968, now abandoned. This application Dec. 11, 1970, Ser. No. 97,363**

**Int. Cl. G11b** *5/02, 5/44, 5/82*

**U.S. Cl. 346—74 M** **5 Claims**



Apparatus which compensates for certain recording characteristics of a magnetic disk file by varying the amplitude of the recording signal supplied a magnetic transducer. The plurality of concentric tracks of a disk are arbitrarily considered as being divided into groups or bands. Logic means responds to the address of the track being written to determine the position of the head among the predetermined bands of tracks and to accordingly control the amplitude of the recording signal by increasing the write current as the outermost band of tracks is neared and reducing the write current as the center-most band of tracks is neared.

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3,653,063

## ELECTRONIC PRINTING DEVICE COMPRISING AN ARRAY OF TUNNEL CATHODES

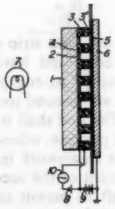
**Eiichi Miyazaki, Tokyo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Dec. 20, 1968, Ser. No. 785,633**

**Claims priority, application Japan, Dec. 28, 1967, 43/125; 43/133; 43/164**

**Int. Cl. G01d** *15/06*

**U.S. Cl. 346—74 EB** **4 Claims**



A solid-state electronic printing device which is compact and does not require the use of a high voltage, wherein the movement of electrons emitted into the atmosphere from a tunnel cathode or a photo-cathode is controlled by the potential of a control electrode disposed in the vicinity of said cathode, thereby said electrons being deposited, directly or in the form of a corresponding amount of ink, on a recording medium according to said potential of said control electrode.

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3,653,064

## ELECTROSTATIC IMAGE-FORMING APPARATUS AND PROCESS

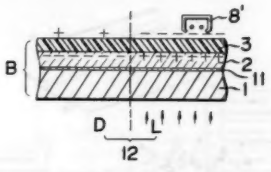
**Eiichi Inoue; Keizo Yamaji; Hiroshi Tanaka, and Takashi Saito, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 20, 1969, Ser. No. 800,962**

**Claims priority, application Japan, Feb. 25, 1968, 43/11875; 43/12739; 43/12740**

**Int. Cl. G03g** *5/02, 13/00, 15/00*

**U.S. Cl. 346—74 ES** **17 Claims**




An electrostatic image-forming process using a plate comprising a substrate, a photoconductive layer and an insulative layer includes the steps of placing an insulative recording member in contact with the insulative layer, the recording member either being previously charged or being charged while in position on the insulative layer, and applying a voltage to the plate and simultaneously irradiating the photoconductive layer with a pattern of image radiation. Apparatus is also disclosed for use in such process and particularly for conversion of electron beams to provide the pattern of image radiation.

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3,653,065

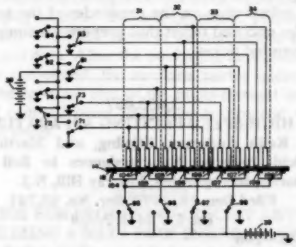
## ELECTROGRAPHIC RECORDING SYSTEM WITH INTERLEAVED ELECTRODE GROUPS

**Arling Dix Brown, Jr., Cleveland Heights, Ohio, assignor to Clevite Corporation**

**Filed Oct. 22, 1969, Ser. No. 868,394**

**Int. Cl. G03g** *13/00, 15/00;* **H04n** *1/24*

**U.S. Cl. 346—74 ES** **11 Claims**



Recording electrodes of a coincidence voltage type electrographic recorder are divided into arrays. Arrays are divided into two or more groups and are interleaved so that no array is adjacent another array of the same group. Like-numbered electrodes of each array in a group are connected together. Complementary electrodes are disposed adjacent to

the arrays. Each is adjacent to only one array of a group and is spaced from all other arrays of the same group. A latent image is formed at one selected recording electrode when suitable voltage is applied to that electrode, and in coincidence therewith, suitable voltage is applied to complementary electrode means adjacent to the selected recording electrode.

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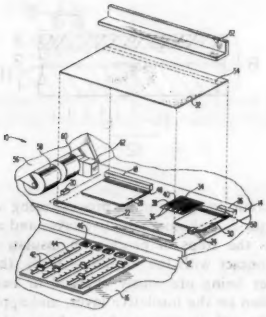
**3,653,066**

## MAGNETIC TRANSFER IMPRINTER

**David Royse, and Guenther K. Machol, both of Saratoga, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 29, 1969, Ser. No. 888,622**
**Int. Cl. G11b *5/16*; G01d *15/12***
**U.S. Cl. 346—74 MP** **1 Claim**



A terminal is provided for recording fixed and variable transaction data in both human and machine readable form from a credit card having an encoded magnetic stripe or track and embossed identification data and from settable means having an encoded magnetic portion and an embossed portion for keying in the variable transaction data. The magnetic copy stripe or track on a record form is held in contact with the magnetic stripe on the credit card and the encoded portions of the settable means. The remainder of the form is placed over the embossures on the settable means and on the credit card. A transfer magnet head and a pressure roller are moved along the form to transfer the magnetic information to the magnetic stripe on the record form and to imprint the embossed information on the remainder of the record form. The transfer encoded ticket thus prepared is compatible with a direct recorded ticket.

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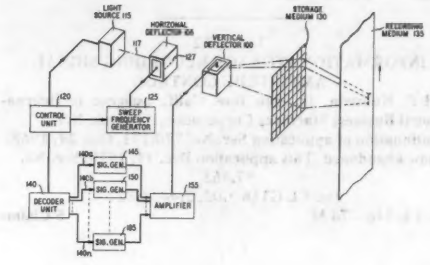
**3,653,067**

## HIGH-SPEED PRINTING APPARATUS

**Lawrence Keith Anderson, Stirling, and Martin Feldman, Springfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Dec. 16, 1970, Ser. No. 98,741**
**Int. Cl. B41b *21/24***
**U.S. Cl. 346—108** **8 Claims**

A high-speed printer includes a prerecorded compressed font stored, for example, in holographic form. The constituent parts (for example, bars) of a set of characters to be printed are stored in the hologram. By means of acousto-optic deflection techniques, an incident light beam is directed to illuminate simultaneously the plural areas of the hologram which store the constituent parts of a character selected to be printed. In turn, representations of the parts stored in the illuminated areas are imaged onto a suitable




recording medium where recombination and printing of the selected character take place.

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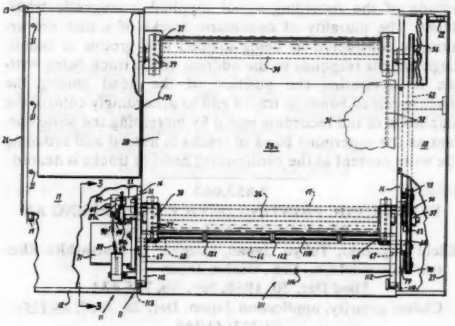
**3,653,068**

## GRAPHIC RECORDER WITH PAPER TENSIONING MECHANISM

**James Franklin Gordon, Saratoga, Calif., assignor to Zeta Research, Inc., Lafayette, Calif.**

**Filed Jan. 18, 1971, Ser. No. 107,161**
**Int. Cl. G01d *15/24*; B65h *23/18***
**U.S. Cl. 346—136** **8 Claims**



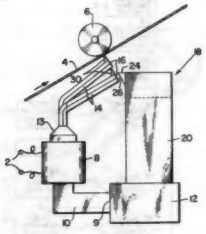
Graphic recorder for use with strip chart having perforations on at least one edge and having first and second sprockets which are adapted to engage the perforations in the strip chart. The first and second sprockets are secured to first and second shafts. The first shaft is rotatably mounted in the framework in a fixed position, whereas the second shaft is rotatably mounted in the framework in such a manner so as to permit pivotal movement of the second shaft toward and away from the first shaft to permit tensioning of the strip chart. Means is provided for rotating the first and second shafts which accommodates the pivotal movement of the second shaft.

3,653,069

## MULTISTYLUS RECORDING HEAD

John A. Baring, Golden, Colo., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Nov. 18, 1970, Ser. No. 90,565
Int. Cl. G01d 15/24
U.S. Cl. 346—139 2 Claims



A multistylus recording head having a plurality of recording styli with each stylus incorporating a multilayer magnetostrictive structure having two adjacent layers with opposing magnetostrictive properties for producing a bending of the stylus in the presence of a longitudinally applied magnetic field. One end of each of the styli is arranged along a recording line and adjacent to a magnetic boundary displacement structure to form a magnetic flux path therewith. The magnetic displacement structure is energized by an input signal to produce a selective displacement of a magnetic null in a composite magnetic field. The magnetic null is positioned with respect to the recording styli whereby a selected stylus is arranged to be in contact with a recording medium while the remaining styli are bent out of contact with the recording medium by effect of the remaining magnetic field.

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3,653,070

## NESTED SLEEVE RECORDING PEN HEAD

Aubrey R. Tullos, and Leslie H. Creed, both of P.O. Box 2373, Odessa, Tex.

Filed Feb. 3, 1970, Ser. No. 8,246
Int. Cl. G01d 15/16
U.S. Cl. 346—140 14 Claims

Special construction of a recording pen for use with capillary tubing in an inking pen system. The pen includes a stainless steel capillary tube terminating in the pen head construction which includes a removable recording pen tip made of a suitable material providing passage for flow of ink to a recording surface. The head includes several coaxial nesting sleeves cooperating to form a small head reservoir located immediately adjacent the pen tip. The end of the capillary tubing is secured to the pen head by bonding between the end of the capillary tubing and at least the outer one of the coaxial sleeves.

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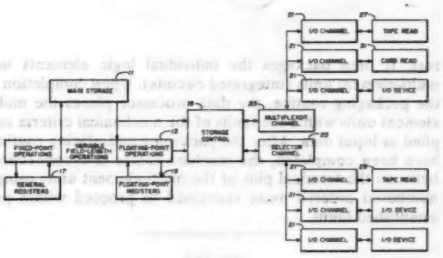
3,653,071

## PROCESS FOR PRODUCING CIRCUIT ARTWORK UTILIZING A DATA PROCESSING MACHINE

John W. Hill, Richardson, and Charles L. Satterwhite, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 8, 1970, Ser. No. 1,346
Int. Cl. G06f 15/46
U.S. Cl. 444—001 36 Claims



Artwork for a logic circuit to be fabricated by printed circuit board techniques is produced by a data processing machine programmed to run a packaging routine, a placement routine, and a routing routine, in addition to check routines. All logic elements for a particular circuit are coded and identified prior to carrying out any of the machine run routines. This circuit diagram information, along with mechanical criteria of the printed circuit board on which the circuit is to be fabricated, are supplied as input data to the data processing machine. The data processing machine first takes the coded circuit diagram information and checks it for errors. It then packages the individual logic elements into multi-element units (integrated circuits). Upon completion of the packaging routine, the data processor places the multi-element units within the limits of the mechanical criteria supplied as input data. After the packaging and placing routines have been completed, the machine routes interconnections between the terminal pins of the multi-element units using a numbered ordered maze restrained to proceed within pre-established limits.

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3,653,072

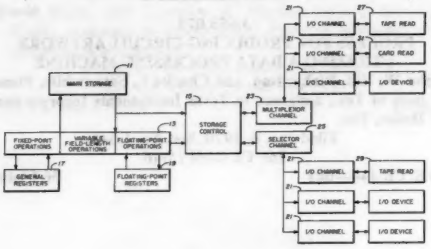
## PROCESS FOR PRODUCING CIRCUIT ARTWORK UTILIZING A DATA PROCESSING MACHINE

Joseph A. Ballas, Dallas, and Robert A. Penick, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 8, 1970, Ser. No. 1,366
Int. Cl. G06f 15/46
U.S. Cl. 444—001 24 Claims

Artwork for a logic circuit to be fabricated by printed circuit board techniques is produced by a data processing

machine programmed to run a packaging routine, a placement routine, and a routing routine, in addition to check routines. All logic elements for a particular circuit are coded and identified prior to carrying out any of the machine run routines. This circuit diagram information, along with mechanical criteria of the printed circuit board on which the circuit is to be fabricated, are supplied as input data to the data processing machine. The data processing machine first takes the coded circuit diagram information and checks it for errors. It then packages the individual logic elements into multi-element units (integrated circuits). Upon completion of the packaging routine, the data processor places the multi-element units within the limits of the mechanical criteria supplied as input data. After the packaging and placing routines have been completed, the machine routes interconnections between the terminal pins of the multi-element units using a numbered ordered maze restrained to proceed within pre-established limits.

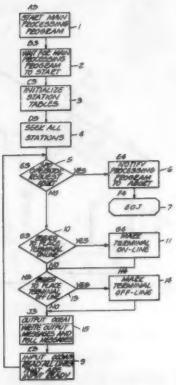



**3,653,073**

## HANDLER PROGRAM FOR REMOTE INPUT MANAGEMENT SYSTEM

**Ralph L. Carpenter, Oakland, and Richard C. Zuchowski, San Francisco, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation**

**Filed Aug. 19, 1969, Ser. No. 851,370**
**Int. Cl. G06f 9/18**
**U.S. Cl. 444—1** **13 Claims**



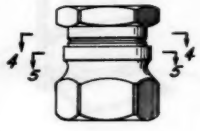

A digital computer program in the ALGOL language for interfacing between remote hardware terminals and a program entitled Main Processing Program. This program passes all data to and from the remote terminals and the Main Processing Program.

# DESIGNS

## MARCH 28, 1972

**223,186**
**FILE HANDLE**
William J. Menser, Baroda, and Fritz G. Hoffmann, St. Joseph, Mich., assignors to Triple C Co., Baroda, Mich.
Filed Aug. 13, 1970, Ser. No. 24,477
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—94

**223,187**
**NUT**
George S. Wing, Palos Verdes Estates, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.
Filed June 22, 1970, Ser. No. 23,598
Term of patent 14 years
Int. Cl. D8—*10*
U.S. Cl. D8—273

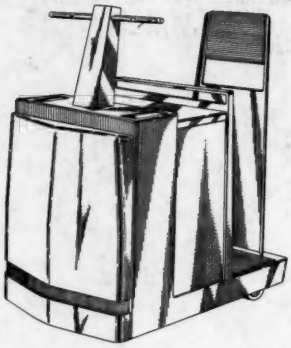



**223,188**
**BOTTLE OR SIMILAR ARTICLE**
Elliott E. Blank, 2920 Dartmouth Drive, Midland, Mich. 48640
Filed Dec. 4, 1970, Ser. No. 26,278
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—60

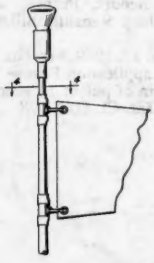
**223,189**
**FOIL PACKAGING TRAY**
David T. Dittman, Atlanta, Ga., assignor to Pet, Incorporated, St. Louis, Mo.
Filed Apr. 3, 1968, Ser. No. 11,287
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219

**223,190**
**AUTOMOBILE VEHICLE BODY**
Michel Tixier, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt, Hauts-de-Seine, France
Filed Nov. 17, 1969, Ser. No. 20,151
Claims priority, application France May 16, 1969
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3

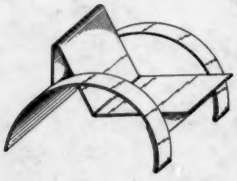
223,191
TOWING VEHICLE
Rigsby C. Satterfield, Chalfont, Pa., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed July 9, 1970, Ser. No. 23,878
Term of patent 7 years
Int. Cl. D12—*09*
U.S. Cl. D14—3



223,192
DUNE BUGGY DISPLAY
Bernard Harold Gertler, 914 W. 17th St., Costa Mesa, Calif. 92627
Filed Dec. 29, 1969, Ser. No. 20,668
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6



223,193
CHAIR
Ching-Yu Chang, Manoa Park Apts. E115, 400 Glendale Road, Havertown, Pa. 19083
Filed Apr. 22, 1970, Ser. No. 22,550
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D15—1

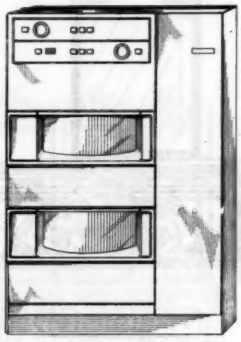


223,194
FISHING LURE
David L. Goforth, 613 W. Kemp Road, Greensboro, N.C. 27410
Filed Nov. 4, 1969, Ser. No. 19,942
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

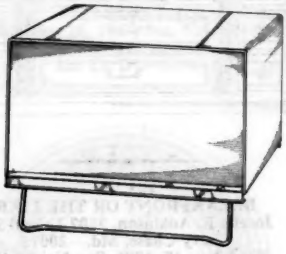
223,195
COMBINED WALL UNIT AND SEAT FOR A BATHTUB OR THE LIKE
Raymond Wallace Young, Louisville, Ky., assignor to American Standard Inc., New York, N.Y.
Continuation-in-part of design application Ser. No. 18,369, July 24, 1969. This application July 20, 1970, Ser. No. 24,037
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69

223,196
MULTIMETER
Joseph R. Andreaggi, Short Hills, and George Zenuch, Edison, N.J., assignors to Weston Instruments, Inc., Newark, N.J.
Filed Dec. 10, 1970, Ser. No. 26,384
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D26—1

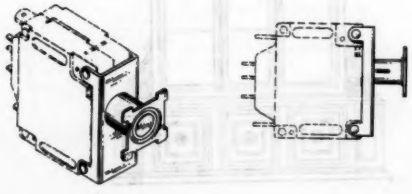
223,197
**DISK STORAGE FILE**
Clifford B. Bisch, Palo Alto, Edward D. Lucey, Los Gatos, Howard S. Noel, Cupertino, and Peter A. Ronzani, Sunnyvale, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 31, 1970, Ser. No. 22,336
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



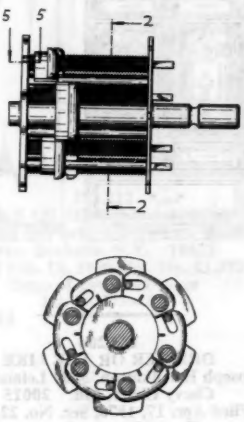
223,198
**STACKABLE HOUSING UNIT FOR ELECTRONIC EQUIPMENT**
Karl Lang, Uerikon, and Hans Steiner, Greifensee, Switzerland, assignors to Mettler Instrumente AG, Zurich, Switzerland
Filed Sept. 10, 1970, Ser. No. 24,936
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



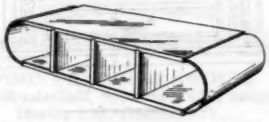
223,199
**ADAPTER FOR A CIRCUIT BREAKER**
Ronald Nicol, Trenton, N.J., assignor to Heinemann Electric Company, Trenton, N.J.
Filed Jan. 22, 1970, Ser. No. 21,039
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



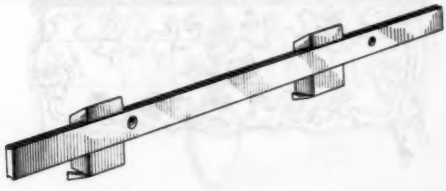
223,200
**ROTOR ASSEMBLY FOR A DETENT TUNING MECHANISM FOR A TELEVISION TUNER**
John Michael Minden Carter, Sutton Coldfield, England, assignor to William Bailey (Birmingham) Limited, Willenhall, England
Filed June 1, 1970, Ser. No. 23,226
Claims priority, application Great Britain Dec. 4, 1969
Term of patent 14 years
Int. Cl. D14—*03, 99*
U.S. Cl. D26—14



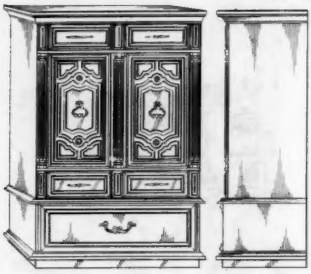

223,201
**SHELF UNIT**
Hans P. Jorgensen, 1931 Raby Road, Haslett, Mich. 48840
Filed Apr. 14, 1970, Ser. No. 22,501
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D33—3



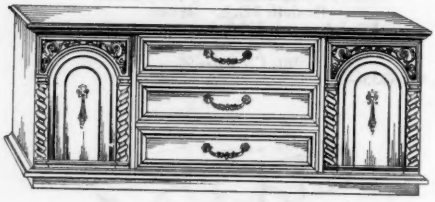
223,202
**SUPPORT RACK FOR MEDICAL IMPLEMENTS**
Morten E. Nyrop, Lyngby, Denmark, assignor to Simonsen & Weels Eftr. A/S, Albertslund, Denmark
Filed June 17, 1970, Ser. No. 23,533
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D33—3



223,203
CHEST OF DRAWERS OR THE LIKE
Joseph E. Adkinson, 3807 Leland St.,
Chevy Chase, Md. 20015
Filed Apr. 17, 1970, Ser. No. 22,482
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D33—6



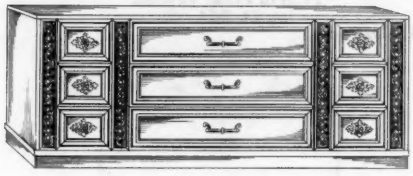
223,204
DRESSER OR THE LIKE
Joseph E. Adkinson, 3807 Leland St.,
Chevy Chase, Md. 20015
Filed Apr. 17, 1970, Ser. No. 22,484
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D33—6



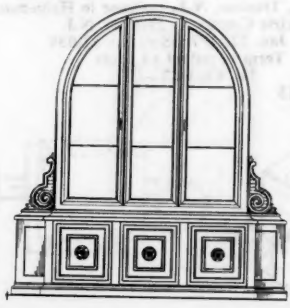
223,205
DRESSER OR THE LIKE
Joseph E. Adkinson, 3807 Leland St.,
Chevy Chase, Md. 20015
Filed Apr. 20, 1970, Ser. No. 22,525
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D33—6

223,206
DRESSER OR THE LIKE
Joseph E. Adkinson, 3807 Leland St.,
Chevy Chase, Md. 20015
Filed Apr. 20, 1970, Ser. No. 22,526
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D33—6

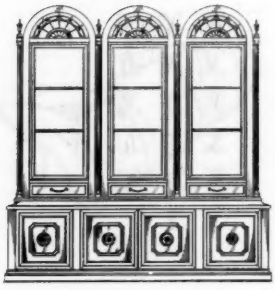
223,207
DRESSER OR THE LIKE
Joseph E. Adkinson, 3807 Leland St.,
Chevy Chase, Md. 20015
Filed Apr. 20, 1970, Ser. No. 22,527
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D33—6



223,208
BREAKFRONT OR THE LIKE
Joseph E. Adkinson, 3807 Leland St.,
Chevy Chase, Md. 20015
Filed Apr. 17, 1970, Ser. No. 22,483
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D33—13



223,209
**BREAKFRONT OR THE LIKE**
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Apr. 20, 1970, Ser. No. 22,524
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D33—13



223,210
**PLATE OR SIMILAR ARTICLE**
Edward J. Bennett, Weston, Conn., and Ronald M. Johnson, New York, N.Y., assignors to Owens-Illinois, Inc.
Filed Nov. 20, 1967, Ser. No. 9,463
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15

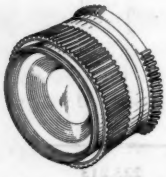
223,211
**THERMOMETER OR SIMILAR ARTICLE**
Clayton A. Laughlin, Minneapolis, Minn., assignor to Arthur Salm Inc., Chicago, Ill.
Filed June 1, 1970, Ser. No. 23,235
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D52—7

223,212
**FORK OR SIMILAR ARTICLE**
Stephen H. Berni, 673 Pelham Road, New Rochelle, N.Y. 10022
Filed Feb. 11, 1970, Ser. No. 21,373
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

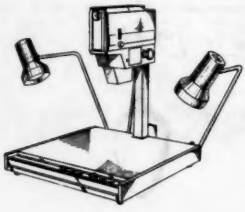
223,213
**SPOON OR SIMILAR ARTICLE**
Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Apr. 13, 1970, Ser. No. 22,391
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

223,214
**STRINGED MUSICAL INSTRUMENT, SPECIFICALLY A UKRAINIAN BANDURKA**
Walter J. Pelensky, 19C Manheim Gardens, Philadelphia, Pa. 19144
Original design application Mar. 28, 1968, Ser. No. 11,179, now Patent No. 216,331, dated Dec. 16, 1969. Divided and this application June 3, 1969, Ser. No. 17,505
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1

223,215
**INTERCHANGEABLE CAMERA LENS**
Denkichi Takata, Tokyo, Japan, assignor to Mamiya Koki Kabushiki Kaisha (also known as Mamiya Camera Co., Ltd), Tokyo-to, Japan
Filed Mar. 31, 1970, Ser. No. 22,134
Claims priority, application Japan Oct. 2, 1969
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1

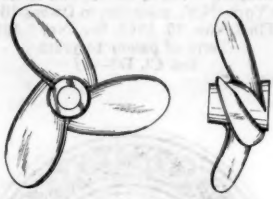


223,216
**SLIDE PROCESSOR CAMERA**
Hiroshi Saito, Osaka, Shuzo Horikoshi, Suita, Iwao Nakajima, Osaka, and Susumu Yamamoto, Moriguchi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed June 18, 1970, Ser. No. 23,549
Claims priority, application Japan Dec. 19, 1969
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1

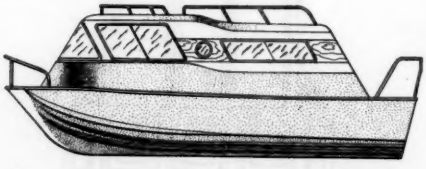


223,217
**ALPHABET FOR MONOGRAMS OR THE LIKE**
George Berlant, Bellerose, N.Y., assignor to New Hermes Engraving Corporation, New York, N.Y.
Filed Nov. 12, 1969, Ser. No. 20,033
Term of patent 14 years
Int. Cl. D18—*04*
U.S. Cl. D64—16

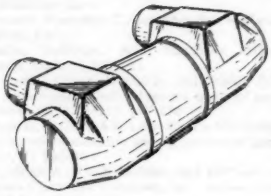
223,218
**PROPELLER**
LeRoy Martens, Lake Crystal, Minn., assignor to Lar-Mar-Co. Props, Incorporated, Lake Crystal, Minn.
Filed Oct. 24, 1969, Ser. No. 19,716
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D71—1

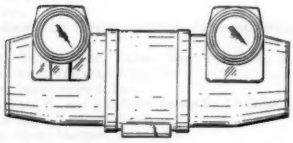


223,219
**BOAT**
Herbert M. Piker, 611 Hickory Hill Lane, Wyoming, Ohio 45215, and Otis C. Borum, Deb Apartments, Apt. 503, 4070 Barnes St., Jacksonville, Fla. 33216
Filed Sept. 9, 1970, Ser. No. 24,897
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



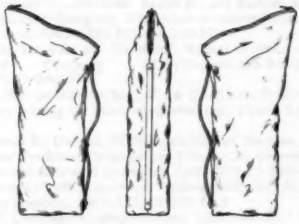
223,220
**X-RAY TUBE HOUSING**
William K. Johnson, Oakbrook, and Paul V. Hartman, Bellwood, Ill., assignors to Picker Corporation, White Plains, N.Y.
Filed May 27, 1970, Ser. No. 23,173
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1





223,221
**BOOT INSERT**
Jesse F. Wright and Blake W. Berdine, Fort Collins, Colo., assignors to Poudre Plastics, Inc., Fort Collins, Colo.
Filed July 6, 1970, Ser. No. 23,832
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D86—10

223,222
**BAG**
Louis J. Christen, Jr., St. Louis, Mo., assignor to J. C. Christen Manufacturing Co., St. Louis, Mo.
Filed Mar. 28, 1969, Ser. No. 16,516
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—3



# LIST OF PATENTEES

## TO WHOM

## PATENTS WERE ISSUED ON THE 28TH DAY OF MARCH, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AB Gustavsbergs Fabriker: *See—*
Bengtsson, Lars-Erik; and Allander, Claes G., 3,651,524.

AB Konsulterna for Industri Och Handel: *See—*
Sundberg, Carl A., 3,653,058.

Abbott Laboratories: *See—*
Garmaise, David L., 3,652,574.
Horrom, Bruce Wayne; and Crovetti, Aldo Joseph, 3,652,670.

Abdullah, Mukhtar: *See—*
Armbruster, Frederick C.; and Abdullah, Mukhtar,3,652,398.

Abe, Masahiro: *See—*
Hatanaka, Yoshihiro; Abe, Masahiro; Oshima, Takeo; and Akioka, Toshio,3,652,081.

Abeck, Wilhelm; Kober, Heinrich; and Seidel, Bernhard, to Agfa-Gevaert Aktiengesellschaft. Magnetic material and method of making the same. 3,652,334, Cl. 117-236.

Abend, Thomas, to Gurit AG. Latently reactive composition reactable under influence of moisture and its method of preparation and use. 3,652,521, Cl. 260-86.1

Aboutboul, Henri A.; Kirch, William; and Krekeler, Jerome H., to National Petro Chemicals Company, Inc., mesne. Preparation of silica gels. 3,652,215, Cl. 23-182.

Aboutboul, Henri A.; and Krekeler, Jerome H., to National Petro Chemicals Company, Inc., mesne. Preparation of silica gels. 3,652,214, Cl. 23-182.

Aboutboul, Henri A.: *See—*
Krekeler, Jerome H.; Aboutboul, Henri A.; and Kirch, William,3,652,216.

Abrahami, Shoshana; Molcho, Aharon; and Wachs, Reuven, to Makhteshim Chemical Works Ltd. Curing of polyester compositions. 3,652,718, Cl. 260-863.

Abt, Ewald: *See—*
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Bayha, Jack E. Method and apparatus for document validation. 3,652,862, Cl. 250-219.

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Beard, Hoyt S., to Reynolds, R. J., Tobacco Company. Smoke filter. 3,651,819, Cl. 131-261.

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Bergeron, Frank E., deceased0 (by Bergeron, Katharine S.; executrix). Lubricating compound. 3,652,415, Cl. 252-36.

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Bessko, Dezso; Gallai, Gyula; Farnady, Pal; Jozsa, Geza; Kovy, Margit; Teller, Laszlo; Suba, Andras; and Tisza, Sandor, to Magyar Optikai Muvek. Geodetic sighting instrument. 3,652,166, Cl. 356-138.

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Beyerle, Rudi; Stachel, Adolf; Nitz, Rolf-Eberhard; Resag, Klaus; and Schraven, Eckard, to Cassella Farbwerke Mainkur Aktiengesellschaft. 3-γ-Tertiary amino-β-alkoxy benzyloxypropyl-4-hydrocarbon-5-8-alkoxy coumarins. 3,652,557, Cl. 260-247.2

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Bialy, Jerzy J.; Siegart, William R.; Blackley, William D.; and Chafetz, Harry, to Texaco Inc. Anti-static fuel composition. 3,652,238, Cl. 44-62.

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Biggs, Carl E., to Textron Inc. Battery charging system using a coulometer as a logic device. 3,652,917, Cl. 320-45.

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Bimler, Rudolf. Device for the treatment of fractures, especially leg fractures. 3,651,803, Cl. 128-88.

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Black, Drummond Steen Poyner. Motor driven vehicular chassis and load carrying platform or container for transport thereby. 3,651,970, Cl. 214-515.

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Bohner, Thomas H.; and Vaillancourt, Vincent L., to Bard, C. R., Inc. Method of packaging between laminated webs with heat and ultrasonic seals. 3,651,615, Cl. 53-28.

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Bolzan, James J., Jr.; and Fromknecht, Charles T. Canister vacuum cleaner with retractable hose. 3,651,536, Cl. 15-323.

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Boone, Philip. Hermetically-sealed products and related method for cleansing and other uses. 3,652,174, Cl. 401-143.

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Boyd, David M., to Universal Oil Products Company. Fluid distribution for fluid-solids contacting chambers. 3,652,451, Cl. 208-146.

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Lester, George R., to Universal Oil Products Company. Preparation of substituted aromatic compounds. 3,652,695, Cl. 260-668.

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Samuels, Marvin S., 3,651,812.
Zuritsky, Joseph S.,: *See*—
Samuels, Marvin S., 3,651,812.
Zwiercan, Gary A.: *See*—
Marotta, Nicholas G.; Zwiercan, Gary A.; and Boettger, Richard M.,3,652,294.

# LIST OF DESIGN PATENTEES

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## PATENTS WERE ISSUED ON THE 28TH DAY OF MARCH, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Adkinson, Jooseph E. Chest of drawers or the like. 223,203, 3–28–72, Cl. D33—6.

Adkinson, Joseph E. Dresser or the like. 223,204, 3–28–72, Cl. D33—6.

Adkinson, Joseph E. Dresser or the like. 223,205, 3–28–72, Cl. D33—6.

Adkinson, Joseph E. Dresser or the like. 223,206, 3–28–72, Cl. D33—6.

Adkinson, Joseph E. Dresser or the like. 223,207, 3–28–72, Cl. D55—6.

Adkinson, Joseph E. Breakfront or the like. 223,208, 3–28–72. Cl. D33—13.

Adkinson, Joseph E. Breakfront or the like. 223,209, 3–28–72, Cl. D33—13.

American Standard Inc. : *See*—
Young, Raymond W. 223,195.

Andreaggi, Joseph R., and G. Zenuch, to Weston Instruments, Inc. Multimeter. 223,196, 3–28–72, Cl. D26—1.

Bailey, William, (Birmingham) Ltd. : *See*—
Carter, John M. M. 223,200.

Bennett, Edward J., and R. M. Johnson, to Owens-Illinois, Inc. Plate or similar article. 223,210, 3–28–72, Cl. D44—15.

Berdine, Blake W. : *See*—
Wright, Jesse F., and Berdine. 223,221.

Berlant, George, to New Hermes Engraving Corp. Alphabet for monograms or the like. 223,217, 3–28–72, Cl. D64—16.

Berni, Stephen H. Fork or similar article. 223,212, 3–28–72, Cl. D54—12.

Bisch, Clifford B., E. D. Lucey, H. S. Noel, and P. A. Ronzani, to International Business Machines Corp. Disk storage file. 223,197, 3–28–72, Cl. D26—5.

Blank, Elliott E. Bottle or similar article. 223,188, 3–28–72, Cl. D9—60.

Borum, Otis C. : *See*—
Piker, Herbert M. 223,219.

Carter, John M. M., to William Bailey (Birmingham) Ltd. Rotor assembly for a detent tuning mechanism for a television tuner. 223,200, 3–28–72, Cl. D26—14.

Chang, Ching-Yu. Chair. 223,193, 3–28–72, Cl. D15—1.

Christen, J. C., Mfg. Co. : *See*—
Christen, Louis J., Jr. 223,222.

Christen, Louis J., Jr., to J. C. Christen Mfg. Co. Bag. 223,-222, 3–28–72, Cl. D87—3.

Dittman, David T., to Pet, Inc. Foil packaging tray. 223,189, 3–28–72, Cl. D9—219.

Eaton Yale & Towne, Inc. : *See*—
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Gertler, Bernard H. Dune buggy display. 223,192, 3–28–72, Cl. D14—6.

Goforth, David L. Fishing lure. 223,194, 3–28–72, Cl. D22—27.

Hartman, Paul V. : *See*—
Johnson, William K., and Hartman. 223,220.

Heinemann Electric Co. : *See*—
Nicol, Ronald. 223,199.

Hi-Shear Corp. : *See*—
Wing, George S. 223,187.

Hoffmann, Fritz G. : *See*—
Menser, William J., and Hoffmann. 223,186.

Horikoshi, Shuzo : *See*—
Saito, Hiroshi, Horikoshi, Nakajima, and Yamamoto. 223,216.

International Business Machines Corp. : *See*—
Bisch, Clifford B., Lucey, Noel, and Ronzani. 223,197.

Johnson, Ronald M. : *See*—
Bennett, Edward J., and Johnson. 223,210.

Johnson, William K., and P. V. Hartman, to Picker Corp. X-ray tube housing. 223,220, 3–28–72, Cl. D83—1.

Jorgensen, Hans P. Shelf unit. 223,201, 3–28–72, Cl. D33—3.

Lang, Karl, and H. Steiner, to Mettler Instrumente AG. Stackable Housing unit for electronic equipment. 223,198, 3–28–72, Cl. D26—5.

Lar-Mar-Co. Props, Inc. : *See*—
Martens, Le Roy. 223,218.

Laughlin, Clayton A., to Arthur Salm, Inc. Thermometer or similar article. 223,211, 3–28–72, Cl. D52—7.

Lucey, Edward D. : *See*—
Bisch, Clifford B., Lucey, Noel, and Ronzani. 223,197.

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Manderfield, Ellen B., to Oneida Ltd. Spoon or similar article. 223,213, 3–28–72, Cl. D54—12.

Martens, LeRoy, to Lar-Mar-Co. Props, Inc. Propeller. 223,-218, 3–28–72, Cl. D71—1.

Matsushita Electric Industrial Co., Ltd. : *See*—
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Nicol, Ronald, to Heinemann Electric Co. Design of an adaptor for a circuit breaker. 223,199, 3–28–72, Cl. D26—13.

Noel, Howard S. : *See*—
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Nyrop, Morten E., to Simonsen & Weels EFTF. A/S Medical implements. 223,202, 3–28–72, Cl. D33—3.

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Owens-Illinois, Inc. : *See*—
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Ronzani, Peter A. : *See*—
Bisch, Clifford B., Lucey, Noel, and Ronzani. 223,197.

Saito, Hiroshi, S. Horikoshi, I. Nakajima, and S. Yamamoto, to Maatsushita Electric Industrial Co., Ltd. Slide processor camera. 223,216, 3–28–72, Cl. D61—1.

Salm, Arthur, Inc. : *See*—
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Satterfield, Rigsby C., to Eaton Yale & Towne, Inc. Towing vehicle. 223,191, 3–28–72, Cl. D14—3.

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Lang, Karl, and Steiner. 223,198.

Takata, Denkichi, to Mamiya Koki Kabushiki Kaisha (a.k.a Mamiya Camera Co., Ltd.). Interchangeable camera lens. 223,215, 3–28–72, Cl. D61—1.

Tixier, Michel, to Regie Nationale des Usines Renault. Automobile vehicle body. 223,190, 3–28–72, Cl. D14—3.

Triple C Co. : *See*—
Menser, William J., and Hoffmann. 223,186.

Weston Instruments, Inc. : *See*—
Andreaggi, Joseph R., and Zenuch. 223,196.

Wing, George S., to Hi-Shear Corp. Nut. 223,187, 3–28–72, Cl. D8—273.

Wright, Jesse F., and B. W. Berdine, to Poudre Plastics, Inc. Boot insert. 223,221, 3–28–72, Cl .D86—10.

Yamamoto, Susumu : *See*—
Saito, Hiroshi, Horikoshi, Nakajima, and Yamamoto. 223,216.

Young, Raymond W., to American Standard Inc. Combined wall unit and seat for a bathtub or the like. 223,195, 3–28–72, Cl. D23—69.

Zenuch, George : *See*—
Andreaggi, Joseph R., and Zenuch. 223,196.

# LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

## DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 28TH DAY OF MARCH, 1972

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Atlas Chemical Industries, Inc.: *See*—
Long, William P., Jr. T896,054.

Bard, Charleton C., and J. O. Kleffner, Retouching colored photographic images. T896,053, 3–28–72, Cl. 96—56.

Carter, Andrew P., Jr.: *See*—
Decker, William D., Carter, and Lewis. T896,049.

Decker, William D., A. P. Carter, Jr., and C. R. Lewis. Modified bobbin chuck. T896,049, 3–28–72, Cl. 242—18.

Du Pont de Nemours, E. I., and Co.: *See*—
Hamlin, Arthur H., Kilkson, and Wood. T896,051.
Long, Victor C. T896,055.

Fairfield, John M., M. Joshi, and G. H. Schwuttke, to International Business Machines Corp. Method for making semiconductor junction devices. T896,048, 3–28–72, Cl. 148—188.

Hamlin, Arthur H., H. Kilkson, and H. P. Wood, to E. I. du Pont de Nemours and Co. Process for forming colloidal polymeric dispersions for making microporous materials. T896,051, 3–28–72, Cl. 260—29.2.

Hercules Inc.: *See*—
Zimmerman, Gerald H. T896,052.

Hoar, Donald W.: *See*—
Olson, Floyd C., and Hoar. T896,050.

International Business Machines Corp.: *See*—
Fairfield, John M., Joshi, and Schwuttke. T896,048.

Joshi, Madhukar: *See*—
Fairchild, John M., Joshi, and Schwuttke. T896,048.

Kilkson, Henn: *See*—
Hamlin, Arthur H., Kilkson, and Wood. T896,051.

Kleffner, Joseph O.: *See*—
Bard, Charleton C., and Kleffner. T896,053.

Lewis, Charles R.: *See*—
Decker, William D., Carter, and Lewis. T896,049.

Long, Victor C., to E. I. du Pont de Nemours and Co. Coordinated ionic hydrocarbon copolymers. T896,055, 3–28–72, Cl. 260—88.1.

Long, William J., Jr., to Atlas Chemical Industries, Inc. Plasticizers for hydroxypropyl cellulose. T896,054, 3–28–72, Cl. 106—188.

Meline, Robert S. Ammonium polyphosphate solutions from super wet acid. T896,056, 3–28–72, Cl. 71—34.

Olson, Floyd C., and D. W. Hoar. Comminuted meat composition containing undenatured water-soluble lactalbumin. T896,050, 3–28–72, Cl. 99—108.

Schwuttke, Guenter H.: *See*—
Fairchild, John M., Joshi, and Schwuttke. T896,048.

Wood, Harry P.: *See*—
Hamlin, Arthur H., Kilkson, and Wood. T896,051.

Zimmerman, Gerald H., to Hercules Incorporated. Wire and cable wrapping material. T896,052, 3–28–72, Cl. 161—123.

# LIST OF REISSUE PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 28TH DAY OF MARCH, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bendix Corp., The: *See*—
Granger, Cyrus M., Slavin, Carp, and Manson. Re. 27,324.

Blake, George E.: *See*—
Platt, William G., and Jacks, Re. 27,323.

Briggs, Eugene C., to Koehring Co. Oil burner. Re. 27,321, 3–28–72, Cl. 431—352.

Ecodyne Corp.: *See*—
Tischler, Edward J. Re. 27,317.

Fujii, Kiichi, M. Oda, J. Arita, M. Takeda, and K. Sakai, to Tanable Seiyaku Co., Ltd. Isolation of threonine and allothreonine from their mixture. Re. 27,322, 3–28–72, Cl. 260—534.

Gensheimer Joseph R., to Lord Corp. Dock fender. Re. 27,318, 3–28–72, Cl. 61—48.

Granger, Cyrus M., M. Slavin, R. W. Carp., and P. St. C. Manson, to The Bendix Corp. Automobile speed control. Re. 27,324, 3–28–72, Cl. 180—105.

Jacks, Roy T.: *See*—
Platt, William G., and Jacks. Re. 27,323.

Koehring Co.: *See*—
Briggs, Eugene C. Re. 27,321.

Loeb, Sidney: *See*—
Manjikian, Serop, Loeb, and McCutchan. Re. 27,319.

Lord Corp.: *See*—
Gensheimer, Joseph R. Re. 27,318.

Manjikian, Serop, S. Loeb, and J. W. McCutchan, to The Regents of the University of California. Method of preparing a semipermeable membrane. Re. 27,319, 3–28–72, Cl. 264—41.

Manson, Peter St. C.: *See*—
Granger, Cyrus M., Slavin, Carp, and Manson. Re. 27,324.

Oda, Mutsuo: *See*—
Fujii, Kiichi, Oda, Arita, Takeda, and Sakai. Re. 27,322.

Platt, William G., and R. T. Jacks; assignors to G. E. Blake, and R. J. Youngblood, Jr., a fractional part interest to each. Chuck. Re. 27,323, 3–28–72, Cl. 279—2.

Polaroid Corp.: *See*—
Tiffany, Douglas B. Re. 27,320.

Sakai, Kango: *See*—
Fujii, Kiichi, Oda, Arita, Takeda, and Sakai. Re. 27,322.

Slavin, Michael: *See*—
Granger, Cyrus M., Slavin, Carp, and Manson. Re. 27,324.

Tanable Seiyaku Co., Ltd.: *See*—
Fujii, Kiichi, Oda, Arita, Takeda, and Sakai. Re. 27,322.

Tiffany, Douglas B., to Polaroid Corp. Photographic processing apparatus. Re. 27,320, 3–28–72, Cl. 95—13.

Tischler, Edward J., to Ecodyne Corp. Timer. Re. 27,317, 3–28–72, Cl. 74—3.5.

University of California, The Regents of the: *See*—
Manjikian, Serop, Loeb, and McCutchan. Re. 27,319.

Youngblood, Raymond J., Jr.: *See*—
Platt, William G., and Jacks. Re. 27,323.

# LIST OF PLANT PATENTEES

Ball, Geo. J., Inc.: *See*—
Klupenger, Joseph H. 3,086.

Costich, Peter E., to Treesearch. Dogwood tree. 3,090, 3–28–72, Cl. 51.

Ecke, Paul, Inc.: *See*—
Hegg, Thormod. 3,082.

Hegg, Thormod, to Paul Ecke, Inc. Poinsettia plant. 3,082, 3–28–72, Cl. 86.

Klupenger, Joseph H., to Geo. J. Ball, Inc. Azalea plant. 3,086, 3–28–72, Cl. 55.

Lewis, Helen H.: *See*—
Lewis, Hubert B. and H. H. 3,089.

Lewis, Hubert B. and H. H. Lewis. Azalea plant. 3,089, 3–28–72, Cl. 56.

Marshall Nurseries: *See*—
Schlapfer, Richard E. 3,088.

McGredy, Samuel. Rose plant. 3,091, 3–28–72, Cl. 20.

Moore, Ralph S. Miniature rose plant. 3,083, 3–28–72, Cl. 10.

Moore, Ralph S. Miniature rose plant. 3,084, 3–28–72, Cl. 9.

Schlapfer, Richard E., to Marshall Nurseries. Ash tree. 3,088, 3–28–72, Cl. 51.

Toy, St. Joseph. Almond tree. 3,085, 3–28–72, Cl. 30.

Treesearch: *See*—
Costich, Peter E. 3,090.

Zaiger, Chris F. Nectarine tree. 3,087, 3–28–72, Cl. 41.

# CLASSIFICATION OF PATENTS

## ISSUED MARCH 28, 1972

NOTE.—First number, class; second number, subclass; third number, patent number

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1.8 3,652,271
33 3,652,272
36 3,652,273
36.3 3,652,274
48PD 3,652,276
48 3,652,275
50PT 3,652,277
61 3,652,278
64 3,652,279
3,652,280
76 3,652,281
3,652,282
84R 3,652,284
84 3,652,283
90PC 3,652,285
100 3,652,286
108 3,652,287
129 3,652,288
139 3,652,289

**CLASS 98**
85 3,651,750

**CLASS 99**
28 3,652,290
3,652,291
71 3,652,292
3,652,293
83 3,652,294
91 3,652,295
94 3,651,768
109 3,652,296
140R 3,652,297
141 3,652,298
144 3,652,299
154 3,652,300
275 3,651,751
357 3,651,752
358 3,651,753

**CLASS 100**
91 3,651,754
96 3,651,755

**CLASS 101**
147 3,651,756
350 3,651,757
3,651,758
395 3,651,759

**CLASS 102**
70.2A 3,651,760
80 3,651,761

**CLASS 104**
12 3,651,762
25 3,651,763
149 3,651,764

**CLASS 105**
61 3,651,765
136 3,651,766
448 3,651,767

**CLASS 106**
5 3,652,301
47R 3,652,302
52 3,652,303
57 3,652,304
58 3,652,305
3,652,306
65 3,652,307
103 3,652,308
110 3,652,309
120 3,652,310
3,652,311
176 3,652,312
193J 3,652,313

**CLASS 108**
56 3,651,769

**CLASS 110**
8A 3,651,771
8R 3,651,770

**CLASS 111**
1 3,651,772

**CLASS 112**
77 3,651,773

**CLASS 113**
113R 3,651,774

**CLASS 114**
66.5H 3,651,775
71 3,651,776
208A 3,651,777
235R 3,651,778

**CLASS 115**
35 3,651,779

**CLASS 116**
115.5 3,651,780

**CLASS 117**
2 3,652,314
17.5 3,652,315
22 3,652,317
33.3 3,652,318
37LE 3,652,319
46 3,652,320
50 3,652,321
73 3,652,316
93 3,652,322
97 3,652,323
106 3,652,324
107 3,652,325
126GE 3,652,326
132B 3,652,327
138.8UA 3,652,328
139.5CQ 3,652,329
201 3,652,330
3,652,331
212 3,652,332
218 3,652,333
236 3,652,334

**CLASS 118**
7 3,651,781
411 3,651,782
505 3,651,783
636 3,651,784

**CLASS 119**
5 3,651,785
17 3,651,786
51 3,651,787

**CLASS 122**
4R 3,651,788
32 3,651,789
182R 3,651,790

**CLASS 123**
32EA 3,651,791
3,651,792
102 3,651,793
120 3,651,794
149A 3,651,795

**CLASS 126**
215 3,651,796
263 3,651,797

**CLASS 128**
2.05S 3,651,798
2.06R 3,651,799
12 3,651,800
53 3,651,801
82 3,651,802
88 3,651,803

145.6 3,651,804
188 3,651,805
214E 3,651,806
214.4 3,651,807
232 3,651,808
290 3,651,809
295 3,651,810
303.1 3,651,813
303.17 3,651,811
303.18 3,651,812

**CLASS 130**
27K 3,651,814

**CLASS 131**
2 3,651,815
144 3,651,816
237 3,651,817
257 3,651,818
261B 3,651,819

**CLASS 132**
5 3,651,820
53 3,651,821

**CLASS 134**
66 3,652,335

**CLASS 135**
24 3,651,822

**CLASS 136**
60 3,652,336
134R 3,652,337
146 3,652,338
161 3,652,339
168 3,652,340
176 3,652,341

**CLASS 137**
72 3,651,823
83 3,651,824
240 3,651,825
247.35 3,651,826
351 3,651,828
469 3,651,827
529 3,651,829
565 3,651,830
588 3,651,831
615 3,651,832
625.65 3,651,833

**CLASS 140**
3R 3,651,834
149 3,651,835

**CLASS 141**
103 3,651,836
128 3,651,837
284 3,651,838

**CLASS 143**
32R 3,651,839
88 3,651,840
133R 3,651,841

**CLASS 144**
3D 3,651,845
136R 3,651,842
198R 3,651,843

**CLASS 145**
31 3,651,844

**CLASS 146**
2C 3,651,846

**CLASS 148**
6.35 3,652,342
31.57 3,652,343
127 3,652,344
134 3,652,345
154 3,652,346
187 3,652,347

**CLASS 149**
36 3,652,348
42 3,652,349
109 3,652,350

**CLASS 150**
28R 3,651,847
38 3,651,848

**CLASS 156**
2 3,652,351
62.4 3,652,352
3,652,353
73 3,652,354
151 3,652,355
179 3,652,356
203 3,652,357
218 3,652,358
224 3,652,359
244 3,652,360
272 3,652,361
321 3,652,362
357 3,652,364
361 3,652,363
381 3,652,365
443 3,652,366
463 3,652,367
501 3,652,368
566 3,652,369

**CLASS 157**
1.1 3,651,849

**CLASS 160**
77 3,651,850
135 3,651,851
172 3,651,852
216 3,651,853
374.1 3,651,854

**CLASS 161**
2 3,652,370
36 3,652,371
39 3,652,372
50 3,652,373
57 3,652,374
158 3,652,375
159 3,652,376
166 3,652,377
182 3,652,378
183 3,652,379
255 3,652,380

**CLASS 162**
2 3,652,381
3 3,652,382
4 3,652,383
19 3,652,384
23 3,652,385
25 3,652,387
65 3,652,386
3,652,388
275 3,652,389
303 3,652,390
343 3,652,391
3,652,392

**CLASS 164**
7 3,651,855
82 3,651,856
283 3,651,857
286 3,651,858
291 3,651,859
339 3,651,860

**CLASS 165**
1 3,651,861
5 3,651,862
11 3,651,863
20 3,651,864
80 3,651,865
107 3,651,866

**CLASS 166**
99 3,651,867
307 3,651,868

**CLASS 169**
38 3,651,869

**CLASS 172**
44 3,651,870

**CLASS 173**
21 3,651,871
24 3,651,872
29 3,651,873
91 3,651,874

**CLASS 174**
11R 3,652,777
15C 3,652,797
28 3,652,778
45R 3,652,780
67 3,652,781
73R 3,652,782

**CLASS 175**
45 3,651,875
323 3,651,876

**CLASS 176**
1 3,652,393
86R 3,652,394

**CLASS 177**
114 3,651,877
230 3,651,878

**CLASS 178**
5.2R 3,652,783
3,652,784
5.4R 3,652,785
3,652,786
3,652,787
6.6SF 3,652,788
6.7R 3,652,789
6.8 3,652,790
7.1R 3,652,791
7.2R 3,652,792
7.6 3,652,793
67 3,652,794

**CLASS 179**
1SA 3,652,801
2DP 3,652,795
7.1R 3,652,796
15AL 3,652,798
15BA 3,652,800
15BS 3,652,799
3,652,802
18ES 3,652,804
18J 3,652,803
84VF 3,652,805
99 3,652,806
100.2E 3,652,808
100.2R 3,652,807
100.4R 3,652,809
184 3,652,810

**CLASS 180**
5R 3,651,879
3,651,881
6R 3,651,880
14R 3,651,882
68.5 3,651,883
69.1 3,651,884
79.2R 3,651,885
91 3,651,886
105R Re.27,324

**CLASS 181**
33G 3,651,887
53 3,651,888

**CLASS 184**
55A 3,651,889

**CLASS 186**
1A 3,651,890

**CLASS 187**
9 3,651,891
29R 3,651,892
94 3,651,893

**CLASS 188**
19 3,651,894
71.6 3,651,895
71.8 3,651,896
72.2 3,651,897
72.5 3,651,898
77R 3,651,899
181A 3,651,901
181T 3,651,900
269 3,651,902
290 3,651,903

**CLASS 192**
4A 3,651,904
17A 3,651,905
35 3,651,906
43 3,651,907
45.1 3,651,908
88A 3,651,909

**CLASS 193**
17 3,651,910
35 3,651,911

**CLASS 194**
4R 3,651,912

**CLASS 195**
28N 3,652,395
28 3,652,396
30 3,652,397
31R 3,652,398
62 3,652,399
66A 3,652,402
66R 3,652,400
3,652,401

**CLASS 197**
36 3,651,913
49 3,651,914
53 3,651,915
54 3,651,916
98 3,651,917

**CLASS 198**
11 3,651,918
16R 3,651,919
21 3,651,920
34 3,651,921
127 3,651,922
168 3,651,923
189 3,651,924
218 3,651,925

**CLASS 200**
5EB 3,652,811
8R 3,652,812
16D 3,652,813
33B 3,652,814
153SC 3,652,815

**CLASS 201**
33 3,652,404
39 3,652,403

**CLASS 202**
216 3,652,426

**CLASS 204**
1T 3,652,427
28 3,652,428
35N 3,652,429
72 3,652,430
129 3,652,431
141 3,652,432
152 3,652,433
158S 3,652,434
159.15 3,652,435
159.21 3,652,436
164 3,652,437
181 3,652,438
195 3,652,439
228 3,652,440
273 3,652,442
280 3,652,441
298 3,652,443
3,652,444

**CLASS 206**
1R 3,651,926
42 3,651,927
45.14 3,651,928
45.33 3,651,929
3,651,930
47A 3,651,931
3,651,932
57 3,651,933
65R 3,651,934
66 3,651,935

**CLASS 208**
6 3,652,445
10 3,652,446
11 3,652,447
87 3,652,448
111 3,652,449
146 3,652,450
3,652,451
321 3,652,452

**CLASS 209**
74M 3,651,936
75 3,651,937
78 3,651,938
121 3,651,939
125 3,651,940
139R 3,651,941

**CLASS 210**
10 3,652,405
11 3,652,406
27 3,652,407
140 3,651,942
242 3,651,943
265 3,651,944
324 3,651,945
387 3,651,946
474 3,651,947
502 3,651,948

**CLASS 211**
177 3,651,949
3,651,950

**CLASS 212**
17 3,651,951
84 3,651,952

**CLASS 213**
43 3,651,953

**CLASS 214**
1BB 3,651,958
1BC 3,651,957
1BE 3,651,956
1P 3,651,955
1Q 3,651,954
2.5 3,651,959
6DK 3,651,961
3,651,962
6G 3,651,963
17DB 3,651,960
36 3,651,964
75R 3,651,965
147G 3,651,966
307 3,651,967
3,651,968
515 3,651,969
3,651,970
768 3,651,971

**CLASS 215**
11B 3,651,973
41 3,651,972

**CLASS 219**
10.61 3,652,816
3,652,817
72 3,652,818
85 3,652,819
107 3,652,820
121EB 3,652,821
130 3,652,822
3,652,823
131WR 3,652,824
373 3,652,825

**CLASS 220**
1.5 3,651,974
4R 3,651,975
23.4 3,651,976
30 3,651,978
31S 3,651,983
41 3,651,979
54 3,651,980
60R 3,651,981
97B 3,651,977
111 3,651,982

**CLASS 221**
3 3,651,984
10 3,651,985
12 3,651,986
13 3,651,987

**CLASS 222**
3 3,651,988
14 3,651,989
94 3,651,990
144.5 3,651,991
153 3,651,992
3,651,993
160 3,651,994
211 3,651,995
385 3,651,996
402.16 3,651,997
488 3,651,998

**CLASS 223**
88 3,651,999
116 3,652,009

**CLASS 224**
42.01 3,652,000

**CLASS 226**
65 3,652,001
172 3,652,002

**CLASS 227**
10 3,652,003
67 3,652,004

**CLASS 229**
40 3,652,005
55 3,652,006
73 3,652,007
85 3,652,008

**CLASS 235**
50 3,652,012
60R 3,652,010
61PE 3,652,826
61.11E 3,652,828
61.11F 3,652,827
61.12M 3,652,829
61.12N 3,652,830
70R 3,652,831
92MP 3,652,832
92SB 3,652,833
3,652,834
104 3,652,011
150.22 3,652,835
150.26 3,652,836
150.27 3,652,837
151.31 3,652,838
152 3,652,839
155 3,652,840
3,652,841
183 3,652,842
3,652,843

**CLASS 239**
132.3 3,652,013
287 3,652,014
338 3,652,015
424.5 3,652,016
453 3,652,017
490 3,652,018
682 3,652,019

**CLASS 240**
1 3,652,844
10.63 3,652,846
54R 3,652,845
78HA 3,652,847
81C 3,652,848

**CLASS 241**
74 3,652,020
172 3,652,021
185 3,652,022
275 3,652,023

**CLASS 242**
1 3,652,024
18R 3,652,025
86.5R 3,652,026
96 3,652,027
129 3,652,028
157.1 3,652,029
201 3,652,030
219 3,652,031

**CLASS 244**
1SA 3,652,033
1SS 3,652,042
3.1 3,652,034
12CW 3,652,035
53B 3,652,036
56 3,652,037
100R 3,652,038
102A 3,652,039
104R 3,652,040
152 3,652,041

**CLASS 246**
393 3,652,849

**CLASS 248**
1 3,652,043
23 3,652,044
62 3,652,045
205R 3,652,046
230 3,652,047
235 3,652,032
243 3,652,048
310 3,652,049
429 3,652,050
444 3,652,051

**CLASS 249**
27 3,652,052

**CLASS 250**
43.5FL 3,652,857
43.5R 3,652,850
54 3,652,851
65R 3,652,852
66 3,652,853
71R 3,652,854
71.5S 3,652,855
83.3HP 3,652,856
199 3,652,858
211J 3,652,859
218 3,652,860
3,652,861
219DF 3,652,863
219DR 3,652,862
219LG 3,652,864

**CLASS 251**
38 3,652,053
65 3,652,054
67 3,652,055

**CLASS 252**
8.8 3,652,419
12 3,652,408
3,652,409
19 3,652,414
32.7E 3,652,410
34.7 3,652,411
36 3,652,415
62.3 3,652,421
62.59 3,652,416
62.9 3,652,412
3,652,413
73 3,652,418
80 3,652,417
101 3,652,420
135 3,652,422
180 3,652,423
182 3,652,424
194 3,652,425
358 3,652,453
373 3,652,454
415 3,652,455
431N 3,652,456
442 3,652,457
454 3,652,458
455Z 3,652,459
475 3,652,460
511 3,652,461
518 3,652,462
519 3,652,463

**CLASS 254**
94 3,652,056
139.1 3,652,057
190 3,652,058

**CLASS 256**
1 3,652,059
19 3,652,060

**CLASS 259**
4 3,652,061
9 3,652,062
109 3,652,063
3,652,064

**CLASS 260**
2BP 3,652,465
2R 3,652,464
2.3 3,652,466
3,652,467
2.5AM 3,652,468
18N 3,652,469
22CB 3,652,470
3,652,472
22R 3,652,471
23H 3,652,473
27EV 3,652,474
29.1SB 3,652,484
29.1B 3,652,475
29.1R 3,652,476
29.3 3,652,477
29.4UA 3,652,478
3,652,479
29.6TA 3,652,480
29.6WB 3,652,481
29.7UP 3,652,483
29.7 3,652,482
31.2N 3,652,485
32.6R 3,652,486
33.6AQ 3,652,487
37SB 3,652,488
40R 3,652,489
41A 3,652,490
41C 3,652,492
41 3,652,491
45.7R 3,652,493
45.85 3,652,494
3,652,495
45.9R 3,652,496
47CP 3,652,498
47UA 3,652,497
49 3,652,499
65 3,652,500
75N 3,652,501
75R 3,652,502
3,652,503
77.5AA 3,652,508
77.5AB 3,652,506
3,652,507
77.5AQ 3,652,505
77.5A 3,652,504
78UA 3,652,511
78A 3,652,510

78R 3,652,509
79.5B 3,652,512
80.3 3,652,513
80.78 3,652,514
3,652,515
83.7 3,652,516
85.1 3,652,517
85.3 3,652,518
3,652,519
86.1 3,652,520
3,652,521
87.5R 3,652,522
88.3A 3,652,523
92.8W 3,652,524
3,652,525
3,652,526
93.7 3,652,527
94.3 3,652,528
3,652,529
112B 3,652,530
112.5 3,652,531
187 3,652,532
203 3,652,533
207 3,652,534
210E 3,652,537
210R 3,652,535
3,652,536
211.5R 3,652,538
231R 3,652,539
232A 3,652,540
233.3R 3,652,542
233.3 3,652,541
239BB 3,652,543
239BD 3,652,754
239A 3,652,544
239B 3,652,545
239.1 3,652,547
3,652,548
239.3A 3,652,549
3,652,552
3,652,553
239.3D 3,652,551
239.3 3,652,550
239.55 3,652,554
240D 3,652,555
242 3,652,556
247.2A 3,652,558
247.2B 3,652,557
247.5R 3,652,559
248AS 3,652,560
248CS 3,652,561
250A 3,652,562
251A 3,652,564
251R 3,652,563
256.4C 3,652,566
256.4N 3,652,565
256.4Q 3,652,567
268BZ 3,652,568
268PE 3,652,569
288R 3,652,570
289R 3,652,571
294.9 3,652,572
295S 3,652,573
296A 3,652,574
297R 3,652,575
3,652,576
306.7 3,652,546
3,652,577
308B 3,652,578
309 3,652,579
309.2 3,652,580
3,652,581
309.5 3,652,582
309.7 3,652,583
310 3,652,584
319.1 3,652,585
326.15 3,652,591
326.16 3,652,592
326.3 3,652,586
3,652,587
3,652,588
326.5M 3,652,589
3,652,590
332.3H 3,652,593
338 3,652,594
340.5 3,652,595
340.9 3,652,596
343.2R 3,652,597
346.3 3,652,598
348R 3,652,600
349 3,652,599
380 3,652,601
391 3,652,602
396R 3,652,603
397.4 3,652,604
3,652,605
397.5 3,652,606
401 3,652,607
408 3,652,609
410.6 3,652,610
413 3,652,611
3,652,612
429R 3,652,613
3,652,615
3,652,616
3,652,617
429 3,652,614
429.7 3,652,618
429.9 3,652,619
439R 3,652,620
448AD 3,652,622
3,652,623
448A 3,652,621
448.2E 3,652,625
3,652,626
448.2N 3,652,624
3,652,627
3,652,629
448.2R 3,652,628
453R 3,652,630
3,652,631
455B 3,652,632
456R 3,652,633
463 3,652,634
464 3,652,635
465D 3,652,636
465G 3,652,637
465.3 3,652,638
465.4 3,652,639
465.7 3,652,640
465.8D 3,652,642
465.8 3,652,641
468R 3,652,643
471R 3,652,644
3,652,645
473G 3,652,646
475FR 3,652,648
475PR 3,652,649
475P 3,652,647
482R 3,652,650
3,652,651
483 3,652,652
485H 3,652,653
486AC 3,652,655
486D 3,652,654
486R 3,652,608
488R 3,652,656
3,652,657
490 3,652,658
498 3,652,659
507R 3,652,660
510 3,652,661
513R 3,652,662
514N 3,652,663
515 3,652,664
520 3,652,665
3,652,666
524M 3,652,667
524R 3,652,668
534M Re.27,322
538 3,652,669
558D 3,652,670
561N 3,652,671
566R 3,652,672
570.5P 3,652,673
586A 3,652,674
600 3,652,675
604HF 3,652,676
606.5F 3,652,677
606.5P 3,652,678
609E 3,652,680
609F 3,652,679
610D 3,652,681
612D 3,652,682
3,652,683
617R 3,652,684
624C 3,652,685
633 3,652,686
648R 3,652,688
651R 3,652,689
652R 3,652,690
653.3 3,652,691
653.7 3,652,692
662R 3,652,693
668A 3,652,694
3,652,695
3,652,697
668B 3,652,696
669 3,652,698
3,652,699
672T 3,652,700
674WC 3,652,701
681 3,652,702
683D 3,652,703
3,652,704
683.15B 3,652,706
3,652,707
683.15D 3,652,687
3,652,705
683.62 3,652,708
683.68 3,652,709
823 3,652,710
825 3,652,711
835 3,652,722
836 3,652,723
837PV 3,652,712
860 3,652,713
3,652,714
3,652,715
3,652,716
861 3,652,717
863 3,652,718
873 3,652,719
876B 3,652,720
3,652,725
876R 3,652,721
3,652,726
3,652,727
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878R 3,652,728
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880B 3,652,732
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897B 3,652,734
926 3,652,735
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946 3,652,738
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956 3,652,741
957 3,652,742
982 3,652,743

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109 3,652,066

**CLASS 263**

.7 3,652,067
50 3,652,068

**CLASS 264**

.5 3,652,744
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14 3,652,746
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45 3,652,748
63 3,652,749
67 3,652,750
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117 3,652,752
177F 3,652,753
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289 3,652,759
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**CLASS 266**

25 3,652,069
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38 3,652,073

**CLASS 267**

137 3,652,074

**CLASS 269**

21 3,652,075
24 3,652,076
322 3,652,077

**CLASS 270**

58 3,652,078
3,652,079
61R 3,652,080

**CLASS 271**

27 3,652,081
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41 3,652,084

**CLASS 272**

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176AA 3,652,095

**CLASS 274**

4F 3,652,096
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**CLASS 277**

59 3,652,098

**CLASS 279**

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51 3,652,100

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6.1 3,652,101
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33.99C 3,652,103
96.2R 3,652,104
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405R 3,652,106

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3 3,652,107
165 3,652,108
176 3,652,109
328 3,652,110
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**CLASS 292**

210 3,652,112
216 3,652,113
281 3,652,114

**CLASS 294**

27H 3,652,115
82 3,652,116
87R 3,652,117
89 3,652,118

**CLASS 296**

23C 3,652,119
23R 3,652,122
24 3,652,120
26 3,652,121
28D 3,652,123
146 3,652,124

**CLASS 297**

61 3,652,125
284 3,652,126
372 3,652,127
408 3,652,128

**CLASS 299**

4 3,652,129
86 3,652,130

**CLASS 302**

28 3,652,131

**CLASS 303**

21BE 3,652,136
21CF 3,652,135
21CG 3,652,132
3,652,133
3,652,134
3,652,137

**CLASS 307**

10R 3,652,865
80 3,652,866
86 3,652,867
116 3,652,868
117 3,652,869
133 3,652,870
230 3,652,871
233 3,652,872
252M 3,652,873
3,652,874
3,652,875
262 3,652,876
308 3,652,877
309 3,652,878

**CLASS 308**

4A 3,652,138
174 3,652,141
187 3,652,139
219 3,652,140

**CLASS 310**

50 3,652,879
54 3,652,880
57 3,652,881
61 3,652,882
74 3,652,883
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163 3,652,885
168 3,652,886
3,652,887
198 3,652,888
259 3,652,889

**CLASS 312**

8 3,652,142
27 3,652,143

**CLASS 313**

60 3,652,890
85S 3,652,895
109.5 3,652,891
116 3,652,892
268 3,652,893
340 3,652,894

**CLASS 315**

31TV 3,652,896

**CLASS 317**

2F 3,652,897
27 3,652,898
101DH 3,652,899
136 3,652,901
148.5R 3,652,900
230 3,652,902
234M 3,652,904
234R 3,652,903
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235R 3,652,907
235 3,652,906
3,652,908

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254 3,652,909
445 3,652,910
474 3,652,911
599 3,652,912
678 3,652,913

**CLASS 320**

1 3,652,914
31 3,652,915
35 3,652,916
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**CLASS 321**

9R 3,652,918
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.5R 3,652,926
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34R 3,652,928
51 3,652,929
57 3,652,930
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137 3,652,936
168 3,652,937

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363 3,652,938
367 3,652,939
446 3,652,940
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**CLASS 328**

120 3,652,943
127 3,652,942
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168 3,652,944

**CLASS 329**

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**CLASS 330**

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15 3,652,947
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57 3,652,952

**CLASS 331**

78 3,652,953
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116M 3,652,955

**CLASS 332**

7.51 3,652,956
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**CLASS 333**

79 3,652,958
81R 3,652,959

**CLASS 334**

15 3,652,960

**CLASS 335**

176 3,652,961
203 3,652,962
205 3,652,963
3,652,964
210 3,652,966
216 3,652,967
277 3,652,965

**CLASS 336**

170 3,652,968

**CLASS 337**

140 3,652,969

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174 3,652,970

**CLASS 339**

8PB 3,652,972
8 3,652,971
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36 3,652,974
111 3,652,975
184R 3,652,976
198R 3,652,977

**CLASS 340**

3R 3,652,978
15.5 3,652,979
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25 3,652,981
35 3,652,982
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60 3,652,985
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173 3,653,002
174TF 3,653,007
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347DD 3,653,034
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347C 3,653,035
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8 3,653,043
100ME 3,653,045
100SA 3,653,046
106R 3,653,047
112CA 3,653,049
112D 3,653,050
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708 3,653,052
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772 3,653,054
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854 3,653,057

**CLASS 346**

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32 3,653,059
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74EB 3,653,063
74ES 3,653,064
3,653,065
74MP 3,653,066
74M 3,653,061
3,653,062
108 3,653,067
136 3,653,068
139 3,653,069
140 3,653,070

**CLASS 350**

3.5 3,652,144
3,652,145
86 3,652,146
113 3,652,147
150 3,652,148
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222 3,652,151
252 3,652,152

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14 3,652,153

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**CLASS 353**

25 3,652,155

**CLASS 355**

8 3,652,156
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4 3,652,159
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| 244 | 3,652,169 | 9 | 3,652,176 | | CLASS 416 | 125 | 3,652,191 | | 3,652,768 | 21 | 3,652,195 |
| 246 | 3,652,170 | 110 | 3,652,177 | 134 | 3,652,185 | | 3,652,192 | 325 | 3,652,769 | 202 | 3,652,196 |
| | CLASS 401 | | 3,652,178 | | CLASS 417 | | CLASS 424 | 327 | 3,652,770 | 326 | 3,652,197 |
| 12 | 3,652,171 | 111 | 3,652,179 | 370 | 3,652,186 | 12 | 3,652,761 | 329 | 3,652,771 | 352 | Re.27,321 |
| 106 | 3,652,172 | 113 | 3,652,180 | 393 | 3,652,187 | 60 | 3,652,762 | 340 | 3,652,772 | | CLASS 444 |
| 110 | 3,652,173 | 117 | 3,652,181 | 511 | 3,652,188 | 181 | 3,652,763 | | CLASS 425 | 1 | 3,653,071 |
| 143 | 3,652,174 | 168 | 3,652,182 | | CLASS 418 | 235 | 3,652,764 | 214 | 3,652,193 | | 3,653,072 |
| | CLASS 408 | | | | | 282 | 3,652,765 | | | | 3,653,073 |

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| | 273 | 223,187 | D22— | 27 | 223,194 | | 14 | 223,200 | | | 223,206 | D54— | 12 | 223,212 | D71— | 1 | 223,218 |
| D 9— | 60 | 223,188 | D23— | 69 | 223,195 | D33— | 3 | 223,201 | | | 223,207 | | | 223,213 | | | 223,219 |
| | 219 | 223,189 | D26— | 1 | 223,196 | | | 223,202 | | 13 | 223,208 | D56— | 1 | 223,214 | D83— | | 223,220 |
| D14— | 3 | 223,190 | | 5 | 223,197 | | 6 | 223,203 | | | 223,209 | D61— | | 223,215 | D86— | 10 | 223,221 |
| | | 223,191 | | | 223,198 | | | 223,204 | D44— | 15 | 223,210 | | | 223,216 | D87— | 3 | 223,222 |
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| | 3,653,071 | | 3,652,976 | | 3,652,844 | | 3,651,983 | 54 : | 3,652,235 | | 3,652,000 |
| | 3,653,072 | 51 : | 3,651,829 | | 3,652,872 | | 3,652,060 | | 3,652,256 | | 3,652,341 |
| 49 : | 3,651,556 | | 3,652,349 | | 3,652,918 | | 3,652,079 | | 3,652,672 | | 3,652,357 |
| | 3,651,581 | | 3,652,365 | | 3,652,934 | | 3,652,101 | 55 : | 3,651,560 | | 3,652,374 |
| | 3,651,651 | | 3,652,387 | 52 : | 3,651,840 | | 3,652,111 | | 3,651,598 | | 3,652,383 |
| | 3,651,741 | | 3,652,431 | | 3,653,052 | | 3,652,197 | | 3,651,807 | | 3,652,389 |
| | 3,651,796 | | 3,652,558 | 53 : | 3,651,588 | | 3,652,233 | | 3,651,809 | | 3,652,390 |
| | 3,652,320 | | 3,652,756 | | 3,651,870 | | 3,652,299 | | 3,651,880 | | 3,652,392 |
| | 3,652,813 | | | | 3,651,952 | | | | | | 3,652,861 |

## DESIGN PATENTS

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 : | 223,187 | 17 : | 223,220 | | 223,206 | | 223,188 | 34 : | 223,196 | 37 : | 223,194 |
| | 223,192 | 21 : | 223,195 | | 223,207 | | 223,201 | | 223,199 | 39 : | 223,219 |
| | 223,197 | 24 : | 223,203 | | 223,208 | 27 : | 223,211 | 36 : | 223,212 | 42 : | 223,191 |
| 8 : | 223,221 | | 223,204 | | 223,209 | | 223,218 | | 223,213 | | 223,193 |
| 9 : | 223,210 | | 223,205 | 26 : | 223,186 | 29 : | 223,222 | | 223,217 | | 223,214 |
| 13 : | 223,189 | | | | | | | | | | |

## PLANT PATENTS

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 : | 3,083 | | 3,085 | | 3,089 | 31 : | 3,088 | 36 : | 3,090 | 41 : | 3,086 |
| 6 : | 3,084 | | 3,087 | | | | | | | | |

## DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 : | T896,049 | 10 : | T896,052 | 36 : | T896,048 | 42 : | T896,051 | 54 : | T896,055 | 55 : | T896,050 |
| 1 : | T896,056 | | T896,054 | | T896,053 | | | | | | |

U.S. GOVERNMENT PRINTING OFFICE: 0—1972

U. S. DEPARTMENT OF COMMERCE
Maurice H. Stans, *Secretary*

PATENT OFFICE
Robert Gottschalk, *Commissioner*